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THE IOWA GAS ASSOCIATION.

Two most pleasing features have been decidedly prominent in the doings of the gas fraternity during the past year, and we are inclined to take some share of credit unto ourselves as possibly having contributed somewhat to the advancement and maintenance of the objects that have achieved this pleasing prominence. First and foremost in value of the two—foremost certainly in so far as the pursuance of the practice tends to free established gas companies from the attacks of opposition marauders—is the almost universal desire to reduce selling rates. Not only has this desire been shown in the spirit, but has been followed in practice to such an extent as to make us feel assured that boards of direction will not in the future deviate from the true course that is to guide them in their dealings with the consumer.

The second feature is the increased degree of interest exhibited in the transactions of our associations of gas engineers and managers. It almost goes without saying that these fraternal gatherings have furnished the original incentive whereby was brought into life and action the policy of selling gas at cheap figures. If, then, our engineering societies had accomplished no other good (it hardly need be added that many a beneficent result has followed from their influence) than this, we might even rest contented with such fruition.

One of the greatest disappointments met with during the year in respect to association developments was the failure of the special committee, appointed by the American Gas Light Association to consider the matters spoken of in the annual addresses of Past-Presidents Hickenlooper and Forstall, to agree upon some concerted plan of action whereby the important subjects alluded to in those presidential communications might have become of permanent value to the fraternity at large. The composition of the committee was such as to cause great things to be looked forward to as the result of their deliberations; but, unfortunately, the report presented by them at the Washington session put an end to all such anticipations. The committee, however, in section 3 of their findings (the report will be found on pages 8 and 9 of this issue) give as their opinion that "a complete organization cannot be immediately effective." But they also add, "It is thought that the foundation of the organization may be already laid in the associations that already exist in several of the States," etc. If the gentlemen of the committee were unable to present any specific plan, such inability cannot be charged against them on account of their not having thoroughly investigated the subject; and if, as seems feasible and reasonable, the ends sought for may be finally gained in the multiplication of State Associations, why, then, we are all the more eager to welcome State Societies to our ranks.

Consequently it is with no common degree of cordiality that we introduce to the fraternity the latest acquisition to the banded brotherhood—and take the liberty of making the introduction in the lines forwarded us by an esteemed correspondent—the Iowa Gas Association:

"BURLINGTON, IOWA, Dec. 27, 1884.

"Editor JOURNAL: By invitation of our enterprising friend and neighbor, A. T. Averill, President of the Cedar Rapids Gas Light Company, a few gas men from this part of our State met, on December 17th, at the Grand Hotel, in Cedar Rapids, and organized themselves under the name of the "Iowa Gas Association," electing R. Spencer, of Burlington, President, and C. M. Williams, of Cedar Rapids, Secretary. After a free interchange of views in an informal way, during the afternoon and evening, the discussion embracing a wide range of subjects of interest to the fraternity of this State, it was

unanimously resolved to meet again, at Burlington, on the third Wednesday of next September. The temperature was intensely cold on date of the initial meeting, and this circumstance prevented quite a number of those invited from being present, but who, no doubt, will find it convenient, and also to their advantage, to be with us at the September meeting. Notice of that event will be given to each one personally in due time.

"Our friend Averill has just finished rebuilding entire, and now has one of the largest and best equipped gas plants in the State of Iowa. Being President and principal owner, by the investment of a large sum of money in this very substantial improvement, he has done a great thing for his town, demonstrated his abiding faith in its future growth, and, at the same time, the permanency and value, both to the community and the investors, of a well-ordered and well-managed gas business. In addition to the pleasure of meeting his friends from other parts of the State, the writer was permitted to partake of the hospitalities of Mr. Averill's genial home during his short stay, and returned back to Burlington feeling that if it were possible for a man burdened with the cares, and subjected to the annoyances, of the gas business to be happy, Mr. Averill must be that man. S."

PRATT'S OIL WORKS GO UP AND COME DOWN.

One of the most important branches of the Standard Oil Company is that known as Pratt's, which is located in Brooklyn (E.D.), on North Twelfth and First streets. The refinery is an immense affair, and its presence has always been looked upon with mistrust and misgiving by the people residing in the vicinity. They have had sufficient reason for such feeling, as every short while a burst up of some kind or another would occur. The Williamsburgh Gas Light Company's works are located on the opposite side of North Twelfth street (the street is only 60 feet wide), and on more than one occasion the gas works employees have been reduced to a state of fear and trembling. It may possibly be remembered that on the night of January 12, 1880, an explosion of one of the large agitators at Pratt's refinery occurred, and such was the violence of the affair that one of the holders of the Williamsburgh Gas Light Company was so badly injured that its contents—in the neighborhood of 100,000 cubic feet—escaped into the open air, but fortunately without exploding. This was the occasion when a certain well-known professor of chemistry in the city of New York, who was afterward called in by the refinery people to investigate the circumstances that led to the outbreak, gave it as his opinion that the exciting cause had emanated from the gas works across the street; or, to put it accurately, the gasholder had been leaking, and the train of escape had been ignited by contact with the light in one of the street gas lamps. By the way, it might just here be remarked that the supposed offending street lantern did not have a single pane of glass broken in it, either before or after the rumpus. But to come back to December 21, 1884. On that date Pratt's works were sadly demoralized by fire and explosion, etc. The flames were not subdued entirely until thirty-six hours after first breaking out, and damage away up in hundreds of thousands resulted—some estimates placing the loss at $700,000. The Williamsburgh Gas Company's coal sheds and hoist ways were damaged to the extent of probably $1,500. The Brooklyn *Daily Eagle*, two or three days after the fire, said that "young Mr. Pratt" claimed that the gas works were in some degree responsible for the origination of the disaster; and it is quite possible he is just about "young" enough to believe so. It would seem to the unprejudiced as though here was a pretty good chance for that enterprising professor to earn another fee. He fixed up a worse case to his own satisfaction four years ago, as stated above, right in the same spot; and there is no earthly reason why he should not be able to do so again. Then, again, on mature reflection, we believe Mr. Rogers, one of the important members of the Pratt combination, now takes a great deal of interest in the affairs of the Williamsburgh Company; and this circumstance may possibly stand in the way of the chemist-professor on this occasion. Too bad.

STILL IN THE LAND OF THE LIVING.

Chicago and Philadelphia journalists pride themselves on every possible occasion that they are possessed of nearly every attribute going to make up the ubiquitary; but, still and all, it is just a trifle too bad that sometimes they *will* make a slip, and the "slip" by its happening has a saddening tendency to convince them that after all their hunt after perfect ubiquity is even yet like unto the search of the ancient student in alchemy, who very often declared that the secret was found—"all but." The latest enterprise in which we have information about our journalistic brethren's newest "slip" is one in regard to their having been ready to publish a certain gentleman's obituary even before the gentleman had "shuffled off this mortal coil," and was still with us hale and hearty in the flesh. The preliminaries were ready, and all that remained was to collect the principal facts so that the funeral sermon might go on; but, to their subsequent consternation, it was speedily learned that the cadaver was not, and so their tear ducts were closed ere rightly their flow had commenced. The plain facts in the particular case are about as follows.

A telegram, dated Chicago, Ills., Dec. 24th, was received by a Philadelphia newspaper, in which it was stated Mr. Thomas C. Hopper, President of the American Meter Company, had dropped dead at the corner of State and Madison streets in the aforementioned city at a late hour on the evening of the 23d. There was some shadow of excuse for the Lake City man's error, but there does not appear to have been any extenuating circumstance furnishing a loophole of escape for his confrere in the City of Brotherly Love. A Mr. Hopper did give up the ghost on the particular spot at the designated hour, but it was not the American Meter Company's President, although the deceased gentleman (Mr. Alfred Hopper) was a cousin of his. There are few men doing buisness in Philadelphia more widely known than Mr. T. C. Hopper, and it would seem as though scant investigation, and made at slight trouble, could speedily have satisfied the Philadelphia scribe as to whether the Chicago despatch contained the elements of truth. This despatch was widely copied by newspapers in different parts of the country, and, naturally enough, much to the annoyance and discomfort of Mr. T. C. Hopper and his family. We take this occasion to say to Mr. H.'s friends and acquaintances in the gas business that he is in the enjoyment of good health and spirits, and that not over two weeks ago, in company with his son, the self-same gentleman paid a visit to the JOURNAL office. Those of our friends who have made the tour to 42 Pine street, Rooms 18, 19, 20, and 25, know just what expenditure of wind and muscle is required to reach the editorial sanctum, and from such knowledge may easily infer how likely it would be for a man unpossessed of a good share of vigor to successfully negotiate the trip.

ANNUAL MEETING OF THE SOCIETY OF GAS LIGHTING.

The Tenth Annual Meeting of the Society of Gas Lighting was held in New York city on date of Thursday, December 18, 1884. The meeting was promptly called to order at the hour of 3 P.M. One of the most gratifying features in connection with the routine business of the Society was the excellent showing of the year's work, made perfectly plain by the Annual Report of the Secretary (Capt. F. S. Benson); and no less pleasing was the knowledge of how the finances had prospered under the guiding care of Treasurer James H. Armington. Both reports were ordered to be spread in full upon the minute books.

Ordinary routine business having been disposed of, the members went into an election for officers to take charge of the Society's affairs during 1885, which resulted in the choice of the following-named gentlemen:

President—Joseph R. Thomas.
Vice-President—Eugene Vanderpool.
Treasurer—James H. Armington.
Secretary—Frederick S. Benson.
Member of Executive Committee—Alfred M. Smith.
Finance Committee—William Coombs, Dudley D. Flemming, and C. H. Coggeshall.

The following designation of names and months in which papers are to be presented was made in accordance with the following allotment:

January, Messrs. Theobald Forstall and Fred. S. Benson; February, Messrs. Thomas Turner and F. C. Sherman; March, Messrs. M. S. Greenough and C. H. Nettleton; April, Messrs. E. Vanderpool and F. A. Sabbaton; May, Messrs. A. B. Slater and C. H. Coggeshall; June, Messrs. Jos. R. Thomas and James H. Armington; July, Messrs. William Coombs and O. E. Cushing; August, Messrs. S. G. Stiness and C. J. R. Humphreys; September, Messrs. J. L. Hallett and William Farmer; October, Messrs. C. D. Lamson and William Mooney; November, Messrs. A. M. Smith and George D. Cabot; December, Messrs. William A. Stedman and D. D. Flemming.

When the business portion of the proceedings was closed the annual dinner was partaken of; and while it may be truthfully stated that a most enjoyable and delightful hour or two was occupied in its discussion, many references were made to the sorrowful occurrence during the twelvemonth that deprived the members of the genial companionship and hearty counsel of their friend and associate, Mr. C. V. Smith.

THE VALUE OF MUNICIPAL CONTRACTS.—In the early part of December the Corporation Counsel of Jersey City, N. J., rendered an opinion concerning the contract entered into between the city of Bergen (now a part of Jersey City) and Messrs. D. & S. Parrish, granting said gentlemen exclusive right to lay pipes in the streets for the supply of gas. The contract was made in 1868, and was subsequently assigned to the Jersey City Gas Light Company. In view of the opposition movement in that locality the legal validity of this measure became of consequence; hence the appeal for its construction by the Corporation Counsel. That eminent authority on how to break contracts gives it as his opinion that the instrument of 1868 has no standing in court. Jersey formerly had the reputation of standing by its contracts.

[OFFICIAL REPORT.—Continued from page 318, Vol. XLI.]

Twelfth Annual Meeting of the American Gas Light Association.

HELD AT WILLARD'S HALL, WASHINGTON, D. C., OCT. 15, 16, AND 17.

SECOND DAY, MORNING SESSION—THURSDAY, OCT. 16.

Immediately after conclusion of joint discussion on the papers of Messrs. Nettleton and McMillin (given in last issue) President Stedman announced that he had appointed, as a

COMMITTEE OF ARRANGEMENTS TO MANAGE AFFAIRS OF NEXT ANNUAL MEETING,

Messrs. A. Hickenlooper, John Fullager, and J. Anderson, of Cincinnati, Ohio; Emerson McMillin, of Columbus, Ohio; and H. J. Reinmund, of Lancaster, Ohio.

DECEASED MEMBERS.

The President next called attention to the fact that the painful duty devolved upon him of announcing to the Association the demise, during the year, of two members, in the persons of Mr. W. G. Cartwright, of Hoboken, N. J., and Mr. M. H. Jones, of Easton, Pa. Continuing his reference to the matter, the Chairman said:

It is fitting that proper recognition of their memories be made by their fellow-members, and that such recognition be spread upon the minutes of the Association. The previous course pursued under similarly sad circumstances was to request the President and Secretary to prepare suitable obituary notices and have the same incorporated in the printed volume of the Transactions. As a volume of the proceedings will be published this year, I would suggest that a committee of two be appointed—care being taken to appoint thereon gentlemen who were familiarly acquainted with the deceased members—with instructions to follow the course established by precedent with regard to these matters.

Mr. S. G. Stiness moved that the usual policy of the Association be followed. The motion was adopted.

AN INVITATION TO VISIT THE WHITE HOUSE.

The President called upon Secretary Humphreys to read the following communication, which had been forwarded the Association from the White House:

EXECUTIVE MANSION, WASHINGTON, D. C., Oct. 16, 1884.

Dear Sir—It gives me pleasure to inform you that the President will receive the members of the American Gas Light Association, with the ladies who accompany them, at a quarter past two o'clock to-day.

A previous engagement precludes naming an earlier hour.

Very respectfully,

O. L. PRUDEN, Sec'y.

WILLIAM A. STEDMAN, Willard's Hotel.

Mr. Stiness—I move you, sir, that we accept the courteous invitation of President Arthur, and that we pay our respects to him this afternoon at the time named. An attempt was made to have the reception hour fixed at one o'clock, but a previous engagement of the President prevented such an arrangement. In a conversation held this morning with Mr. Pruden (President Arthur's private secretary), it was stated to the gentleman that the time occupied at the Executive Mansion by the members of the Association need not exceed ten or fifteen minutes. In view of this, it will therefore not become necessary to make any serious inroad upon the time which has been allotted for our session of this afternoon. I think, sir, it is nothing more than proper to one who has so manfully and creditably borne the mantle thrust upon him, that the American Association of Gas Engineers, coming as they do from all parts of the United States, should take this opportunity to pay their respects to him, not only as a gentleman, but also to him as the honored head of our nation.

Mr. Helme seconded the motion.

Mr. M. S. Greenough—I would like to inquire what the intention of the Executive Committee is. Are we to leave the hotel in a body at two o'clock, or are we to meet at the White House at a quarter past two?

Mr. Stiness—The Executive Committee decided we were to meet here. It was stated to the Committee, by the Private Secretary of the President, that at the White House two o'clock meant just two o'clock. In conversation with Mr. Helme, of the Committee of Arrangements (who was much pressed with business and asked me to attend to these details), it was arranged that we should leave here shortly before two o'clock, so as to reach the White House at the hour named in the invitation. Mr. Pruden explained that the President would enter the reception room at exactly a quarter past two. It was thought proper the Association should visit the Executive Mansion in a body, as they deemed that course the more becoming way of paying their respects to the President.

The motion to accept the invitation read by Secretary Humphreys was unanimously adopted.

THE RECEPTION.

When the appointed time had arrived the members of the Association, escorting the lady visitors, and a few invited guests—the total delegation numbering about 250—assembled in the parlor of Willard's Hotel, and from thence proceeded to the White House. Arriving at the Executive Mansion, the visitors were conducted by Secretary Pruden to the "East Room," and were subsequently shown into the "Blue Room," where their formal presentation to President Arthur was made. The distinguished and affable gentleman received the delegates with his wonted courtesy, and not a single hitch marred the progress of the ceremony.

SECOND DAY—AFTERNOON SESSION.

At three o'clock P.M. the Association reconvened, and the following order of business proceeded with:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

The President—The Committee on President's Address have presented a report, which the Secretary will please read. Secretary Humphreys then read the following:

"Gentlemen—Your Committee, to whom was referred the address of our President, would most respectfully report that the time before the close of this meeting does not admit of that careful consideration of the topics (so forcibly expressed by him) that their importance demands.

"Your Committee would, however, recall for your consideration, and recommend that some action be taken by the Society at this meeting, on the subject of combating the organized raiders on the gas interests—who are now so active throughout the country.

"Your Committee also recommend that five hundred copies of the address be printed for the use of the members.

F. C. SHERMAN,
W. H. DENNISTON,
D. D. FLEMMING, } Committee."

The President—If there be no objection I declare the report received. What further action upon it shall be taken?

Mr. Denniston—I think there should be 700 copies of the address printed, so that two copies may be furnished each member. I therefore move that the recommendation of the Committee be amended by the insertion of the words "seven hundred" in place of "five hundred."

The amendment was agreed to, and the resolution, as amended, was adopted.

A communication from Mr. A. L. Allen, of Poughkeepsie, N. Y., was read, and laid upon the table.

The President—We have a paper contributed by Mr. R. B. Taber, of New Bedford, Mass.; but unfortunately a case of severe illness in his family prevented the attendance of the gentleman at our sessions. The paper awaits your decision as to whether or not it shall be read.

On motion of Capt. W. H. White the paper was received, and Secretary Humphreys was instructed to read it to the Association. In accordance with this plan the Secretary read the communication (forwarded by Mr. R. B. Taber, of the New Bedford (Mass.) Gas Light Company), which was entitled—

GAS STOVES A MEANS OF REVENUE.

Gas stoves represent, I think, a species (in naturalist's phrase) of which the whole question of the application of the heating power of gas to domestic and mechanical labor is the genus; and I confess myself a poor student who hopes much and knows little of the extent of that genus. But the study is everyday becoming more interesting since the additional impetus given by the constant discovery of natural gas in the gas wells of Pennsylvania, and the heating gas operators are developing every day a field which is the legitimate and direct work of the gas companies. Truly, we do not fully occupy our ground in the matter of illumination; the limit of saturation—the point at which the consumer has all the light he wants in the place he wants it, and is fairly satisfied—is nowhere attained, in New England, at least; but I take the hint from the heating company, and am bold to nail my Thesis on the church door of this Association, viz: A gas company shall be able to contract to light a hotel, cook its dinners, run its elevator, and heat its halls, as cheaply as can be done by any one else, and further, do all this more satisfactorily than any other agent, and I will defend my proposition.

The demonstration afforded in the series of the South Foreland lighthouse experiments, that gas has its "unco grip" on the heat end of the solar spectrum, from whence neither oil nor electricity can drive it, might be laid as a foundation for the theory of the heating power in the new study of thermal dynamics. The lately published facts concerning the conservation of heat force as expended in an Otto gas engine gives further encouragement; and the German experiments in the relative caloric effects of different gases drives the gas manager to his benches with a grim smile.

One thing developed the past few years is noticeable. Gas men learned from the steel trade how to apply heat; and the Siemens burner is as grea

a success, *per ipse*, as the steel ingot. Mr. Fletcher, of Warrington, has applied to his laboratory apparatus a heated blast of air and gas. Is it possible that in that torrid climate of 2,300°, in which gas first develops, we shall find the first fruitage; that the greatest calorific power and most powerful illumination will be obtained by keeping this intense temperature, or as near this as practicable, at the point of ignition?

Turning now from the genus to the species—the application of gas as heat to domestic uses in the cooking and heating stoves—much that is satisfactory has been accomplished.

Since the gas companies turned their attention to this subject the small, two-ringed boiling stoves, often apparently contrived to emit the worst possible odor, have been withdrawn to give way to the self-supporting ranges—"kitcheners"—set up with iron connecting pipe—no longer summer residents merely, but veritable sojourners in the land. Experience has taught also the New Bedford Company to make all bills for the rental of heating stoves to expire May first of the following year; and to so place the stoves in the kitchens that they may remain all winter to further this object of making the gas stove a fixity. I would not, of course, imply there is no use for these smaller stoves, so serviceable in the nursery and for other small work. I simply call attention to the fact that there is a good call for gas for cooking in winter as well as in summer, and the knowledge that has been gained in practice can be thus formulated. Make your stoves serviceable all the year round.

It is not, in my opinion, a vexed or debatable point, "Can we afford to *rent* the stoves?" I dare propose, to those who cannot see enough profit in renting them, the other alternative, "give them away;" and in this proposition do not forget that they cost enough—indeed, the gas industry is handicapped by the stupendous price of these ungainly erections. True, we now have nickel trimmings free, and, now and then, steatite burners; still, oh, monstrous! "But one half penny worth of bread to this intolerable deal of sack."

Would that our friends the gas meter and stove companies would make their wares handsomer and their prices lower, following the example of our gas companies which reduce the price and raise the candle power at the same time.

This much might be said for the system of rental; it brings the stove within reach of all, thereby directly attaining the object sought—increased day consumption. I think a fair rental to cover depreciation, care and labor, may be made to cover all the "outs" of this system.

The theoretical question of what kind of burner is best really is of little practical importance. An essay on this subject would be more fitting to such a body as this than to the occupant of the kitchen. It is possibly certain that the open flame burner under the oven is as available and powerful as any other form. Recent experiments, published in the English *Journal of Gas Lighting*, tend in that direction; but, as to my own judgment in this matter, practice must decide, although it is universally admitted the open flame has none of the drawbacks of the atmospheric burner at the period of first ignition, and this settles that point. For the ringed burners on the top of stoves, the green fires of the Fletcher type, as developed by the Buffalo Dental Company, are specimens of the finest combustion.

Economically the character of the burner is of no importance. All stove makers now manufacture their goods to burn about the same quantity of gas per hour at the same pressure; but more depends by far on the character of the person in whose hands the burner is placed than the kind of burner used; and everything depends on its simplicity and freedom from noise, as also from foul odors.

A gas heater is more profitable even than the cook stove as regards gas consumption; but the attendant circumstances are different. The consumption will perhaps average 50 per cent. more with the latter than the former; but this supply will be taken from mains not now lying idle; and since they are used in closed rooms, flues should be provided for the exit of waste products of combustion. The gas log is simply insufferable without a chimney attachment; the different forms of atmospheric burners are dangerous in tightly closed rooms, and the combustion of air in the open flame arrangement is decidedly deleterious. An experiment was tried with a "Verity fire" in an open grate without flue, which, after the first ten minutes every morning, worked well and without any perceptible odor; but with a flue, and the addition of being well set up, there is no cheerier fire, nor one so easily attended to, or so prompt in its action. I think for closed stoves the flameless fire will ultimately prove the most efficient. This idea is as yet hardly developed by gas stove makers.

After all, to sum up, what is the advantage of the gas stove speculation? Does it pay? As an outside branch of the business it might be said it draws customers, promotes good will, and indirectly prompts the consumer to find other uses for your product, thus accustoming him to the use of gas. If it served no other object, this last would be a great inducement in itself, and would offset the incurring of much care and inconvenience. The other liabilities—interest, depreciation, pipe, labor, etc.—are like unto your service and meter in disguise, not a direct source of revenue, not intended to be (but really, practically) paid for by the rental.

The stove business, kept as a separate account, relieved by the credit of rentals, at the end of four years stands, say, at $4,000—this outlay including the cost of many patterns of useless stoves—which dead accumulation can only he charged to that familiar source, "the pursuit of knowledge." On this capital the depreciation is 10 per cent.—$400; labor in setting stoves and cost of pipe for present year, $200; total, $600. The rentals for the present year on 300 stoves, including heaters, will be $750, returning, therefore, an interest sum of 4 per cent. on the account. In the same time, however, the day consumption has increased step by step, until it now is three millions feet a year in excess of the ante-stove age, while in all that period not an extra laborer nor a single extra bench has been called in to aid the manufacturing department in making the few thousands feet of output required daily to supply this increased sale.

A heating gas company's engineer lately informed me he had sold 160,000 cubic feet of gas a day in this branch of our business—employing gas for its calorific uses only. There is surely encouragement, then, for that new race of mortals who shall take the gas so learnedly and wisely made by the gentlemen of this Association, and dispose of it in the infinite variety of ways to which it may be applied.

On motion of Mr. H. B. Leach, the thanks of the Association were extended to the author.

Discussion.

Mr. J. P. Harbison—There are some statements in the paper presented by Mr. Taber with which my experience does not permit me to agree. I do not agree with him in that the proper way of attending to this business is solved by the rental system. I am totally opposed to that plan of procedure. I believe if gas companies generally should go into that style of business they would regret it exceedingly. They would be forced to employ a number of men to look after their wares, because the people who take the stoves, paying only a small rent for them, would feel no sort of responsibility with regard to the condition in which they were kept; and the gas companies would find, as a rule, that the stoves (being made, as they are, of sheet iron) would very seriously depreciate in value if not properly cared for—they would not receive the same share of attention that would be bestowed upon them if the persons employing them had bought them outright. Every housekeeper desires to manipulate matters in her kitchen for herself, and, naturally enough, objects to being dictated to or directed in her domestic affairs by an officer or employee of the gas company. I think such would be the general experience throughout the country. I believe we would be making ourselves a good deal of trouble were we to go into a house and suggest to the lady that she direct her kitchen maid to keep the gas stove clean, to polish it up, to take strict care of the burners, and all that sort of thing, finishing the list of instructions by insisting that all these methods must be pursued with great regularity. Now, on the other hand, if a stove is purchased outright, and is then worn out or destroyed through the owner's neglect, why, the loss falls upon the owner, and the cost of this matter then ceases to be an expense, *per se*, to the gas company. In our city of Hartford we have had no trouble in the matter of selling the stoves; and we also note that those who are desirous of introducing gas stoves into their houses do not hesitate very long at the price. The Hartford Company, being practically, as the gas brethren all know, a benevolent institution, we do not ask any profit on the stoves we sell. We obtain the largest rate of discount which we can induce the stove manufacturers to grant us; and we give the party who purchases one of them the full benefit of that discount, simply adding the freight to first cost of stove. We also charge a customer the actual cost of connecting material used, also charging the value of time actually spent in doing the work. We do not give away anything. We make a profit on the gas that we sell, but none whatever on the appliances for consuming it. We have had very good success, and have now at work between six and seven hundred stoves in our "little town." The number is continually increasing; and we have yet to find a single case where the users have not obtained entire and perfect satisfaction. Further than this, we have had no complaints regarding statement of account for the gas consumed. It is not in every case possible that the first attempts to work upon the stove meet with full success; but it is our practice to send an expert to give fullest instructions as to their manner of operation. The expert's duty is to show in a practical manner that any and every sort of cooking can be done and well done; in fact, that every cooking operation may be performed more satisfactorily, at much less expense, and with far greater comfort, on the gas cooker than with a coal heated range. If gas managers generally should give their close attention to this business, they would undoubtedly find their annual consumption greatly increased. Such has been my experience; and further, as you reduce the selling rates from time to time, you will note the consumption will increase in still greater ratio in this direction. As has been well said in the paper, this consumption, aside from the raw material and cost of purification, practically costs the gas company nothing,

and would require no additional meter (which is a crumb of comfort to the meter manufacturers), and would exact no additional clerical force to make out the bills, for the gas consumed in the cookers would all go into the consumer's lighting account. We find that the plan works well, and is especially desirable of development since the extra demand made upon us may be furnished at that period of the 24 hours when our mains are not driven to supply gas for illuminating purposes. It is a most profitable sort of consumption to us in Hartford, and I have no doubt that it is just as profitable to others who are working in a similar way.

Mr. Pratt—What is the price charged by you for gas supplied to stoves?

Mr. Harbison—At the present time the price of gas in our city is $1.80; after the 1st day of December it will be but $1,60—such course having been agreed to by a vote of our directors taken on Monday of this week. (Applause.) In further reply to the question as to what we charge for gas supplied to stoves, I will say that we make no distinction. The gas passes through the same meter as does the gas supplied for purposes of illumination; and we are no respecter of persons in our business. The price is the same to everybody, no matter whether he burns 100 feet of gas in a month or whether his consumption reaches to 100,000 feet in the same space of time. The price in the past has been the same to all, and will be so in the future.

Mr. W. H. Pearson—My experience differs from that of Mr. Harbison in regard to the renting of gas stoves. Of course, being over in Canada, we are differently circumstanced from the position held by you in the States. We have no manufacturers there who will take hold of the business exclusively; and in Toronto we are under the necessity of manufacturing our own gas stoves, or at least a considerable portion of them. We have found, in our attempt to introduce gas stoves, that it is impossible, in the first instance, to sell them outright at all. Having had no experience in the use of gas cookers, the people are not willing to spend $25 (or more) in their purchase until they know something about them. We were at first, therefore, under the absolute necessity of leasing or renting them, and are obliged to do so even at the present time, in order that the people may become fully aware of their value. My plan has been to charge a sufficiently high rent for a stove to make it desirable for the parties to purchase it at the end of four or five months. I find that people after having had a gas stove in use for four or five months, and becoming satisfied with it (as happens in almost every instance), they will purchase it; and such has been the case more largely this year than ever before. This may partly have occurred in consequence of the fact that on a certain kind of gas stove we decided to charge an increased rent. People are willing to spend four or five dollars in the way of rental when they are not willing to spend a much larger sum in the purchase of a stove. Our experience may differ hereafter, when the people are more fully alive to the advantages and benefits to be derived from cooking by gas. The paper suggests, if I recollect rightly, that, on the whole, the open flame burner was found to be more economical than the atmospheric burner. Just before leaving home I had some tests made with the different burners. I could not make them personally, as I was so much pressed for time; but I have every confidence in the person who carried them out and reported the results. The only sort of stove used in the tests was that of the description furnished by the Goodwin Company, and I should be very glad if someone connected with that establishment would furnish an explanation that would account for the different cooking results obtained when employing the different classes of burners. The stove may be heated by two methods, being fitted with both an atmospheric and an open flame burner. There may possibly have been something wrong about the tests; but if so I cannot trace that something out. The results were as follows: With the atmospheric burner we cooked 6½ pounds of beef in a period of one hour and forty minutes, and a total consumption of 24.9 feet of gas; with the open flame burner the same quantity of beef took three hours and twenty minutes time in its cooking, and a consumption of 42.7 feet of gas. I recently made a test on a stove that is sold in Montreal; operated with an atmospheric burner, it baked 6½ pounds of beef in one hour and forty-five minutes, the duty being accomplished with a consumpttion of 24.9 feet of gas, or just the same as accomplished in the case of the Goodwin stove. With the stove manufactured by ourselves, and operated with an atmospheric burner, we cooked 6½ pounds of beef in one hour and forty minutes, and with a consumption of 22 cubic feet of gas. In the Montreal stove, fitted with an open flame burner, we baked two loaves of bread, weighing 1½ pounds each, in 55 minutes, the gas consumption being 17.1 cubic feet; with our own stove, heating conditions being identical, the same duty was accomplished in 45 minutes, and with a gas consumption of only 14 cubic feet. In each case, so far as I could ascertain, the bread was baked equally well, and the beef was cooked (as nearly as we could judge) to exactly the same degree. I have often heard that the open flame burner was the more economical, but my own experience does not tend in that direction. I find that the open flame burners, and partiularly so those right under the oven, gradually get partially choked up. Perhaps this may be accounted for by the large percentage of carbon contained in the water gas manufactured by us, and that such stoppage is not experienced by those supplying coal gas. Taking it altogether, my experience has been decidedly in favor of the Bunsen burner. With regard to the better introduction of gas stoves, I may state that we have found it advantageous to sell the gas consumed in them at a somewhat lower rate than is charged for that supplied for illumination. We are now selling gas for cooking and heating purposes, and also for gas engines, at $1.25 per thousand feet; our regular price for illuminating purposes to our smallest consumers being $1.60, and to consumers of over 200,000 feet monthly, $1.25. Here, again, we differ a little from friend Harbison. The result of reducing the price and introducing the stoves has been very largely to increase our consumption for this purpose. We sent out 200 gas cookers this season. I estimate that our consumption for purposes other than illumination amounts to 12,000,000 cubic feet per annum, and it continues rapidly to increase.

Mr. H. B. Leach—Our experience has been very similar to that of Mr. Pearson. I am very glad that our friend Harbison has got a class of consumers who are willing to purchase the stoves; but in our little village I speedily found it would be impossible to introduce them in that manner, although I tried very hard to accomplish it. Having determined to introduce them at any rate, I found the only successful means of doing so was by renting them. I have been very successful in the endeavor, and feel perfectly satisfied with the result.

Mr. T. Littlehales—My own experience differs somewhat from that of Mr. Pearson. I would almost feel more disposed to give the stoves away than to lease them. We at first tried the leasing policy, and we found that when we had them returned to us the sheet iron would be half rusted through, they would be covered with grease; in short, it would take a man three-quarters of a day to clean one of them up. When we would send the refurbished stove out again, the lady of the house would say: "I don't want a second-hand stove; I want a new one." Then, again, when we charged anything like a reasonable rent, they would say: "What is the cost of this stove?" I would name the price (our rental rate was rather a large percentage on the cost), and the answer would be: "You are a modest man to ask such a large rate of interest on your money as that." Oftentimes they would buy the stove rather than pay what they thought a high rent. We found this style of complaint somewhat of a drawback to the leasing system. We appear now to have found a plan which will work very satisfactorily. When a person wants a gas stove we will say to him that it will do such and such things; that we are willing to put it up in his house, and make the connections; then if it does not do what we say it will we will remove it without cost to him. If, on a trial, it is found to do what we said it would, then we ask him to pay for it. I dislike the leasing plan very much. I believe that the trouble, annoyance and loss by the leasing practice more than counterbalances the advantage in increased send-out.

Mr. Leach—I omitted to say that the parties are obliged to take the same stove the next year if they wish to rent; but if they wish then to purchase we sell them a new stove.

Mr. G. D. Cabot—It seems to me that the matter of renting the stoves is one to be determined very much by the locality. Some of the gas people in towns near to our city rent their stoves, and I know that some of the stoves have been returned in very bad condition. My plan has been quite similar to that of Mr. Harbison—to sell the stoves at cost price. If a person makes any objection to immediate purchase, we put in a stove and let him use it for ten days or a fortnight, and then if he does not like it we will take it out. We have about two hundred stoves now in use, and have never been called upon to take back a single one. It seems to me that the matter of renting is one of those things to be decided upon by the local agent.

Mr. Harbison—Perhaps it is due to myself to state to the Association just what has been our course in our dealing with the people in regard to this matter. You will remember that, some years ago, a member of this Association was requested to furnish the Association with some statistics showing comparisons between cooking done upon gas stoves and that upon coal ranges; also statistics regarding the cost of fuel, and with respect to the results in weight of meats cooked, the percentage of loss, etc. I succeeded in obtaining a large number of copies of that table of statistics, and I have had them very generally distributed amongst our consumers. We have not hesitated to stake our reputation on the correctness of those statements. We have assured the people, on the strength of those statistics (knowing that the author was ready to back up any assertions that might be made which were not any greater than he had put forth), that there would be so great a saving in the weight of meat cooked on the gas stove, as compared with that cooked on the coal range, as to pay for the cost of the fuel used; so that really, in point of fact, it did not cost the householder a farthing for gaseous fuel for cooking purposes. When a man can boldly and unreservedly make that statement and be prepared to back it up with figures, there is no difficulty in selling stoves at cost rather than renting them. It at once takes away all objection to immediate and outright purchase. We can as-

sure them that it will not cost anything for fuel, that the cooking will be better done, and that it will be pleasanter and more convenient to them every way than was the old practice. I first demonstrated the accuracy of the statistics to my own satisfaction, by placing a cooker in the kitchen of my own residence, and making thereon a series of careful tests. The tests were convincing, and so I placed myself in the position to say to my consumers that the printed tables were accurately truthful. We have found our people ready to believe what we say with regard to it, and find them so now, too. I will say, further, that I do not know of a single case, since we commenced selling gas stoves, where a party has declined to own merely because it cost him something to do it. Every party who expressed a wish for a cooking stove has bought it and paid for it, and no one has declined to take a stove because we would not rent it to him.

Mr. Pearson—I may say that in Toronto I have done everything that Mr. Harbison has stated—possibly a little more. Every gas bill has printed upon its face, in such a place that everyone who reads it must notice it, a brief statement of the various advantages of gas cookers as compared with coal ranges. In addition to that, every gas consumer has more than once had circulars sent to him containing information with regard to the comparative amount of loss sustained by various articles of food during the process of cooking; yet, notwithstanding that, we have not been able (or not until very recently) to get the people in our city to purchase gas stoves. I might mention another matter connected with the gas stove business, and that is with reference to the attempt to introduce the use of gas stoves throughout the whole of the year. The principal objection made by my people to keeping them up all the year has been that, with the ordinary gas stove, they cannot heat water for their baths. I might mention that our street foreman, Mr. Laxton, has, after a good deal of experimenting, introduced a system of burners into an ordinary cooking stove; that cooking stove will cook by gas as well as any gas stove that I have ever seen, and the cost of introducing the pipes is only some seven or eight dollars. Underneath the water heater in this stove are placed a couple of Bunsen burners; and they will sufficiently heat water for the bath. A patent has recently been obtained for it, covering the United States as well as Canada; and members of the Association will soon hear more about it. I am satisfied it is going to fill a gap which we have felt to be a wide one for many years past.

Mr. T. D. Gilbert—If there is anything connected with the gas business that I may claim to be conversant with it is perhaps this very question of gas stoves. The discussion we have listened to all goes to show that if gas managers will in some way bring good gas stoves before their communities they can get good returns from them. One man may have better luck in renting, another may have better luck in selling, and yet another may find it to his interest to give them away. But that is not the point. The real question is, "Can we get the people generally to use them?" My own experience corresponds with that of Mr. Harbison. I first put a gas stove in my own house and satisfied myself that it was a good thing. Then the neighbors began talking about it. I got some of the more experimental of the residents to make a trial of them; I told them to bring the stoves back if they did not like them. By and by one after another began to employ them, and everybody liked them. At the beginning of the new year they did not go fast enough to suit us; so we took 20 per cent. discount right off from the manufacturer's prices, and thought it was a good investment. To show that it was, we got our money back in three months on every one of them so sold. This all goes to show that there are a hundred ways in which we can get these stoves before the people and induce the consumer to use them; still, the main point is, the greater the number we get into use the better off we shall be. As to the best way of effecting their introduction, it would seem as though each must be governed by his own necessities and experience.

Mr. Harbison—What is your price for gas per thousand?

Mr. Gilbert—Our average price, or the rate at which most of our consumption is supplied, is $1.70. We are located away up in the wooded district (Grand Rapids, Mich.), and are obliged to haul our coal by rail for close on to 600 miles.

Mr. Starr—Are all classes of your supply registered on one meter?

Mr. Gilbert—The consumption is all registered on one meter, whether used for illumination or for cooking. We had at one time quite a serious opposition developed in the introduction and use of gasoline stoves. Twenty years ago we began the sale of gas cooking apparatus; and during the first seven years our success was so great that 95 per cent. of our consumers used gas stoves. The stoves, however, were all of very small sizes, but were found very effective. When the larger stoves and ranges came out some two or three years ago, our people wanted to get them and willingly gave up the small affairs. We have now about 250 large stoves at work in our town. It has been rather a misfortune to the gas interest that gas stoves have been so poorly arranged. They are made too deep and too short. You can only get one pie in an oven at one time; and people object to employing so much heat for such a small cooking operation. I understand that a gas stove is now being manufactured which has an oven 18 or 20 inches in length; this improvement is in the right direction. There is no trouble in constructing gas stoves so as to deal properly with the products of combustion. The injurious and noxious fumes may all be safely carried off by simple flue connections. I am in hopes that by next year our gas stoves will have been so improved in shape and size that they will be rendered really invaluable to the housekeeper. We have labored under great difficulties heretofore on account of the cramped oven. I have not been a thorough advocate of the gas stove until this year. As to renting or selling—I tell any man who asks about the gas stove that I will set one up in his house free of cost to him; then, if he does not like it, I will take it back. In one or two instances I have had to take them back; but it is indeed very seldom that I am asked to do so.

Upon conclusion of the discussion the Chairman called for the reading of the next paper on the list, and accordingly introduced Mr. Thomas D. Gilbert, Secretary and Treasurer of the Grand Rapids (Mich.) Gas Light Company, who read the following paper on the subject of

THE RELATION OF CAPITAL TO THE OUTPUT.

The proportion of capital to its product should always be intimately considered by those seeking investments. If, through mismanagement or circumstances beyond control, any enterprise absorbs more money than is necessary to the accomplishment of a given amount of work, the result will be either small dividends or the charging of a price for the product that will induce competition from others who may wish to engage in the same business, and who perhaps will accordingly be enabled to do so under more favorable auspices than did the pioneers.

Heretofore this question of a proper relative proportion between the amount invested in gas works and the output of gas, or product of the capital, does not seem to have received much consideration. The reason is obvious, and may be briefly stated thus: Outside a few seaboard cities that had already attained considerable prominence before gas came into use, the organization and early history of all our gas companies has been much the same. Given a thriving town of a few thousand inhabitants; a few energetic men, with perhaps limited means; an exclusive charter from the municipality, with the right to charge what now seems to have been a high price for gas; works of a very limited capacity, built without reference to possible future needs; a steady increase or demand for light, until enlargement became necessary; again, an insufficient investment, owing to want of means or lack of faith in the future, etc.; tearing down and building greater, and we have the history of most of the gas works in the country.

All managers of gas property understand perfectly well that, could they start anew, it would be easy, with present knowledge and experience, to renew their plant with a smaller investment than was possible under former methods. On this enhanced cost stockholders naturally expected their dividends; and so it has come about that, in most places, high prices have been maintained, the use of gas restricted, managers became unpopular, and the business, in public estimation, became a synonym for everything disreputable.

Protected by supposed exclusive rights, the business was a monopoly; and it cannot be denied that until quite recently there has been shown a great want of that progressive spirit on the part of gas managers which gives to all business its best results. Under these circumstances new methods and new lights came into existence. Competition, encouraged by stubborn adherence on the part of old companies to high prices, obtained a foothold in many places, and the owners of gas property were obliged to consider the question whether the capital represented by their stock was not excessive. There is but little invested capital that occupies so precarious a position as gas property at the present time, unless well managed. The manufacture and distribution of gas is a business so peculiar in many of its characteristics as to be almost outside the domain of rules governing other enterprises. Capital once thus invested cannot be moved; and if not profitable, is lost forever. Competition is so deadly to it that it is impossible for rival companies to occupy the same streets without ruin to both, or a consolidation, with its attendant double investment, and cheap light rendered an impossibility.

How to avoid the evils of competition and an unnecessary investment of capital are questions that must be considered; for on them rests the value of all gas property. The exact amount of investment necessary or proper to produce one million cubic feet of gas is, of course, impossible to fix, owing to varying conditions of population, business, and cost of material. A densely populated district, with its usual proportion of large consumers of gas, should require a smaller proportionate investment than a sparsely settled territory, and hence be able to obtain gas cheaper; but it does not always work out in that way. The cost of many of our gas works has been enhanced by circumstances beyond control. In this country more than in any other we have periods of unusual development in all our cities. In the West we call it a "boom;" and "booms" have usually been contemporaneous with times of great railroad development.

These abnormal conditions have usually made necessary large present investments intended to meet future increased demands for gas and the money placed at a time when iron and labor (factors which enter so largely into the cost of gas works) were unusually high. Have we a right to expect full dividends on capital invested under such circumstances? Undisturbed and exclusive possession of the territory occupied is essential to success in our business, and will be beneficial to the public, if we deal fairly with it; but we have no right to expect it, unless we are content with moderate dividends on a fair valuation of our property. The interests of all who own gas property are so interwoven that what benefits or injures one benefits or injures all; and this is my only apology for calling the attention of the Association at this time to a question which is of more essential importance than any other connected with our business. If a company, favorably situated, persists in maintaining prices that seem excessive, for the purpose of paying dividends on excessive capital, it may be sure that rivals, attracted by a seeming opportunity for good investments, will, sooner or later, obtain a foothold, with the usual result of gas sold without profit, until both parties tire of the foolish contest, and "pool their issues." Then the public pays a price for light that will earn and pay dividends on the double investment; and a just relative proportion between the capital and the output rendered forever impossible. During the time that rival companies are furnishing gas at, or below, cost, their pernicious example is quoted as proof that prices elsewhere are excessive; and so it happens that this senseless rivalry works great injury to those who are earnestly striving to keep down their investments with a view to furnishing light at the lowest price consistent with reasonable dividends.

You will notice that I have not undertaken to say anything in this paper about what my own ideas are on the subject, because it is impossible to establish a rule which will be fair in all localities. I merely state in general terms what the policy of my company has been. Our city is not a very large one; we have only about 42,000 inhabitants; and we are now experiencing decided symptoms of the electric lighting craze. For many years we have been selling gas at much cheaper rates than those obtained in most of the large cities in our country. Cities like Detroit, Indianapolis, Chicago and New York have been charging from 20 to 25 per cent. more for gas than we have been charging. We have been satisfied with our dividends, and have been moderately successful. We found that our capital was increasing out of proportion to our output, for the very reason that we were compelled to rebuild when material was high. We have laid pipe in our street mains that cost us $75 per ton; and we also have pipe that cost us but $30 per ton. We were brought face to face with the question of how much of that cost we ought to charge up to construction. We have during the last six years adopted the policy of charging everything to expense that pertains to the enlargement and extension of our works, and give our stockholders the benefit of the rest of it. One result of this has been that we are now fairly successful. The people have been satisfied with the price of gas; and there has been no trouble as yet with competition. They may come "nosing" around us by-and-by, but there is not much temptation for the wreckers in view of the price at which we are selling gas. We think, on the whole, the policy we have pursued has been the better one. Of course, in the large cities they have their investments made; they also have their combinations, and they have things so arranged that what would apply to most of us would not apply to any of them. I take it, from what I have been able to hear and learn, that most of us here represent companies in the smaller cities. We have heard nothing said from the larger cities. I think that our interests are identical, and are all in the direction that I have taken the liberty to point out in the paper, which I submit to you for what it is worth.

On motion of Mr. Helme a vote of thanks was tendered to Mr. Gilbert.

Discussion.

Mr. William Helme—What is your capital and your output per annum?

Mr. Gilbert—Of course there are things connected with all gas companies that the owners do not care to publish; but I shall be very happy, in any private conversation with the gentleman, to give him any information of that kind desired.

Mr. Starr—What is the price of your gas?

Mr. Gilbert—We have three classes of customers: Those who consume 5,000 feet per month are charged at the rate of $1.60; those who use between 1,000 and 5,000 feet pay $1.80; and consumers of a lesser quantity than 1,000 cubic feet in thirty days pay at the rate of $2 per thousand. We are of the opinion that our schedule is a low one. Mr. Harbison calls particular attention to the fact that all classes of his consumers are supplied at one price. Of course, he does his business in the manner deemed best by himself; yet it seems to me that the practice is not consistent with the general law of trade. You can always buy 100 yards of any material at a lesser figure than if you purchased but one yard; and it is perfectly proper that such should be the case. It is no more troublesome to take the register of a meter that has passed 10,000 feet in a week than it is to take the one that has passed but 100 feet; indeed, I never could see any justice in putting an all-round price upon the gas sold. The increase in our business over that of a year ago, owing to the reduction in price and on account of the more general introduction of gas stoves and engines, has been so great that I can see the way clear to another considerable decrease in price in the very near future. There has been an advance of 20 per cent. in our output during the last year.

Mr. Helme—At what figure were you selling gas on the 1st of October, in year 1883?

Mr. Gilbert—At an average figure of $2 per thousand cubic feet.

Mr. Helme—What is your output now?

Mr. Gilbert—The annual output now is 50,000,000 cubic feet.

Mr. Harbison—How many miles of mains have you?

Mr. Gilbert—About 24 miles.

Mr. Helme—If Mr. Gilbert has a capital of half a million dollars, he has $10 invested for every thousand cubic feet of output for the year. I presume that his capital is very much less than that; and I do not doubt that his establishment is in excellent financial condition. If any of his shares are for sale at par I would like a chance at them.

Mr. Gilbert—I will tell the gentleman that I consider an investment of over $5,000 to a million feet of output too large.

Mr. Helme—Any man who has stock in a gas company which has only $5,000 invested for each million feet of output per year is in a very good condition. It is almost impossible to avoid putting more money than that in building gas works, even at the present time. Ours is a very peculiar business. What would be a very good rule in any other business does not always work out well in this. Towns that grow are eternally wanting you to extend your mains. Nine-tenths of your stockholders are not found in a proper financial condition when a sudden call is made upon them to contribute the capital necessary for an extension of the mains. What is the result? It is what every Californian understands by the words "freezing out." Those who cannot respond are frozen out; and this is not fair. There may be a few who are able and willing to respond; but the poorer ones will find themselves out in the cold. And yet, if you attempt to keep down to $5,000 of capital invested to each million cubic feet of output, you will soon be in need of money to extend your mains; and if the extensions are not made you will have rather a lively time in quieting the demands made upon you. Every time you meet a resident of one of your suburban districts the first request will be, "When are you going to extend the gas mains out to my house?" After one or two oral applications of that nature are made from several residents of a particular district, and when it is found that the gas company is not acting quickly enough to suit the views of the complainants, why, the malcontents at next election elect a Councilman, perhaps, who will annoy you very much. In such suburban main extensions you are often required to spend thousands of dollars on which you get but sparse returns. If you measure in all cases the amount you must expend by the amount of business you get, the investment will sometimes amount to $50 on a thousand feet. Under those circumstances what would you do? There are a good many here who would like to know from Mr. Gilbert just how he would solve that problem.

Mr. Harbison—I think Mr. Gilbert has answered it by the statement that he charges a portion of his consumers $1.60 to $1.80 per thousand, while the remainder pay $2. Those who are paying him $1.80 and $2 are contributing the means, in the excess of price charged over their fellows, for making these enlargements. He charges the expense to construction account, and gives the stockholders what is left; and this, according to his statement, they seem to be perfectly satisfied with. By his scheme the poorer people of Grand Rapids are extending his works for him, and are doing so for the benefit of the rich. My practice is in accordance with the example set us a great many years ago, in paying the laborer who wrought all day at the same rate as the one who wrought but an hour; and the one who wrought an hour at the same rate as the one who wrought all day—putting them all on the same footing. That is precisely the sort of golden rule that we are following. We make no distinction, but treat everybody alike, and try to gain the goodwill and confidence of all. In that way you increase your business so largely (and by bringing the price down low to begin with) that you have no difficulty in bringing the pro rata of percentage of the amount invested in proportion to your output; and you thus accomplish it in a way much more satisfactory to the people, and also to your own conscience. You can thus secure a low rate of investment in proportion to the amount of gas sent out.

Mr. Gilbert—This discussion has taken somewhat of the form of an arraignment; and I desire to say this much in reply: Our very smallest consumers are furnished with gas at $2. Mr. Harbison speaks of that rate as being excessive; but I hardly think that he meant to use that term in an offensive sense.

Mr. Harbison—Not at all.

Mr. Gilbert—Even our smallest consumers in Grand Rapids have had gas, for the last year or two, at a less price than that paid by the large consumers

in a great many of our chief cities; and so we have no cause for conscientious trouble about it. We feel, indeed, as though we had been working for the good of all of them. If this discussion will only bring the gas fraternity to consider the question whether they will not put down prices, and get along with less capital, before they tempt competition and ruin their property, it will not have been in vain. That is the real problem before us. You cannot afford to invite competition. Of course, there may be differences of opinion about the policy of having varying schedules of prices; but it has been a good rule in all other classes of business to make such differential rates, and to our people the arrangement has been, and is, perfectly satisfactory. Nobody complains. The man who lives on the outskirts, and pays $2 per thousand, is perfectly satisfied, and would almost (because we have run the pipe to him) be satisfied at price. My friend Helme inquires how we can extend our mains without calling on the stockholders for more capital, and thus perhaps freeze out somebody who cannot respond. It is because, as I have already stated, if we have accumulated a surplus, (no matter how small it may be) beyond what we consider a fair dividend, we invest that surplus right into the operation of main extension. Perhaps we could lay by enough to add three or four miles of main to our system, possibly we could add but one mile in the twelvemonth; but we are all the time doing something in that direction, and always in those districts where the action will be most beneficial to us. We certainly have a good deal of pipe which is not productive; but the people living in those neighborhoods are generally folks who do business down town, and are consequently using gas in their stores and shops. At any rate, I know the plan works harmoniously with us.

Mr. W. H. Pearson—What do you consider a decent dividend?

Mr. Gilbert—That depends upon what the people have been accustomed to receiving.

Mr. Thos. Butterworth—Are the parties who originally owned and built the Grand Rapids works also at this date interested in the management?

Mr. Gilbert—Yes, sir.

Mr. Butterworth—There has been no "freezing out?"

Mr. Gilbert—No. We now have some of the same men in the company who were in it at the beginning, and when we were only sending out one million cubic feet per year.

Mr. Helme—What are Mr. Gilbert's dividends? Let us hear that.

Mr. Greenough—I want to say that I am very glad Mr. Gilbert has brought this thing up. Mr. Gilbert may possibly look upon himself as a man who has been arraigned for an imposition; but I want him to understand that there are a good many men in the gas fraternity who are backing him. It is a principle which has been active in the guidance of a good many gas companies. I think it is wrong to load up any sort of stock with all the water it can carry; and if the plan of the stock jobber is brought up in this meeting, it ought to receive the condemnation of the Association. It is a matter which has not in this country received the attention that it deserves, although it is a question that is gone into pretty carefully on the other side of the water. One of the most careful figurers in the gas profession a few years ago read a paper on the relation of capital to output, and in it he took the ground that any company with over £5 capital for every ton of coal carbonized, had got too much money invested. Putting that into our money it means that you must earn 25 cents per 1,000 feet of gas sold, in order to pay a ten per cent. dividend. The old English figure is one shilling for gas, one shilling for distribution, and one shilling for interest; but we cannot do that on this side of the water; although the company with which I am connected have, by pursuing the policy which Mr. Gilbert has followed in his company, brought themselves into very nearly that position. We have not got to earn much more than 25 cents in order to pay our dividend, and we are consequently in first-class fighting condition. I have no doubt that you can today put up works in all the large cities which as dividend payers will not require over 50 cents earned per thousand feet of gas consumed. When people allow themselves to put more stock than that into gas works, I think they are loading the business with more capital than it is intended for. I think this Association desires to endorse the views of Mr. Gilbert in giving an expression of their opinion on this matter. (Applause.)

Mr. Eugene Vanderpool—I have to differ with my friend Greenough with reference to the amount of capital invested in gas works in England in proportion to the number of thousand feet of gas distributed per annum, and to state that one shilling will not, in all cases, pay ten per cent. interest on the capital. I have some memoranda here which I took from Mr. Field's analysis of the accounts of the London gas companies, the suburban companies, and the provincial companies, both those owned by the cities and those owned by private corporations. I find that the capital, per thousand feet of gas sold per annum in London, is $3.22; of the suburban companies, $3.62; of the provincial companies owned by the cities, $3.52; and of the provincial companies owned by private corporations, $2.94. But the sales of gas there are much larger than with us, being in the city of London 5,580 per annum per head of population; in the large towns, 4,238; and in the smaller towns, 2,500 to 2,800 cubic feet. I have the returns of a number of companies in this country, and find that the capital invested, per thousand feet of gas sold per annum, will run, in towns of from five to ten thousand inhabitants, at about $15; from 10,000 to 25,000, $8; from 25,000 to 50,000 inhabitants, $8; and from 50,000 to 100,000, $7; and from 100,000 and upwards, $6.25. The sales per head of population vary from 400 feet in the small towns, to 2,600 in the large cities. We must remember that in this country materials and labor are from two to three times higher than in England.

Mr. Greenough—As I understand the gentleman's figures, he says that from a population of a hundred thousand up the investment averages about $6.25. You have to earn 62 cents in order to pay 10 per cent. dividend. I do not think that that invalidates my position at all. Mr. Livesey took the ground that those English companies had too much capital invested; that a good deal of the capital of the chartered companies was invested uselessly, and, to a certain extent, was thrown away. Those works could be replaced to-day at figures which would pay 25 per cent., beyond doubt. If the capitals of companies in this country be taken into account, I want gentlemen to remember how much capital has been put into most of our large cities which is uncalled for and unnecessary. In the city of New York to-day there is some $26,000,000 of capital invested owing to competing gas companies. Will the gentleman tell me that if new works were to be there built, $15,000,000 would not be ample to supply the needs of New York's consumers? In Baltimore (Md.) they had 9½ millions dollars invested before they took in the new Equitable Company into the last arrangement; yet at Baltimore they do not sell as much gas as we do in Boston, with but one-quarter of their capital. In Chicago (Ills.), as in some other large cities, they have a large amount of stock which is not represented by plant, etc. If the gentleman wishes to take the actual cost of the work, or what the stock should really represent, he will not, in my judgment, find the sums figure out to $6.25.

Mr. McMillin—One of our noted gas financiers, Gen. Andrew Hickenlooper, of Cincinnati, Ohio, some years ago investigated this question pretty thoroughly; and in his annual address to this Association he spoke of it. His estimate for the entire country was about $8 per thousand. In the preparation of a volume of "Economic Geology for Ohio," I had occasion to investigate the question pretty thoroughly; and I found that sum ($8) was just about what was invested per thousand in the State of Ohio. The figures agree pretty well with those presented by Mr. Vanderpool. From the Columbus (Ohio) works we sent out last year 120,000,000 feet, and this year we will probably send out 150,000,000. Our capital, up to the first of last April, was $400,000, but it has since been increased to $500,000.

Mr. Wood—I think possibly one of Mr. Gilbert's remarks has been either overlooked or forgotten. This is in regard to the assertion which enables him to pay out of expense account for the extension of mains, declare dividends, and sell gas at a low price. It may be accounted for in his case in this way, owing to low distribution charges. He has only 24 miles of mains for conveying an annual output of 50,000,000 feet; and I think that main mileage is very largely below the average of companies represented here. It seems that his town is very compactly built up, consequently his conduits do not extend for miles out into the country, as is the case with many of us. His cost of distribution, therefore, is brought down to a minimum, which fact enables him to do as he has told us.

Mr. Gilbert—We have five or six miles of mains that do not pay 3 per cent. on the investment.

Mr. Helme—What were you selling gas at last year?

Mr. Gilbert—Two dollars per thousand on the average.

Mr. Geo. B. Neal—The hour fixed by the Committee of Arrangements for adjourning is six o'clock, and we have still the report of the Special Committee on the addresses of Past-Presidents Hickenlooper and Forstall to consider. While this discussion is very interesting, it seems to me that we shall not now have time to prolong it if we propose to adjourn at six o'clock. I would therefore suggest that we proceed to consider the report on the President's Address. I think we should not allow any discussion, however interesting, to crowd out the reception of the report mentioned.

The President—If it be the pleasure of the Association we will now listen to the report of the Special Committee appointed to consider the suggestions embraced in the inaugural addresses of Past-Presidents Hickenlooper and Forstall.

In accordance with the President's request, Mr. Eugene Vanderpool, chairman of that Special Committee, presented and read the following report:

REPORT OF COMMITTEE ON ADDRESSES OF PAST PRESIDENTS.

To the Members of the American Gas Light Association—Gentlemen: The Committee appointed by you to consider the recommendations contained in the annual addresses of Past-Presidents Hickenlooper and Forstall, would respectfully submit the following as a supplemental and final report:

1. It is the opinion of your Committee that it would be decidedly advantageous to the gas interests of the country if there was an organization prop-

erly officered and efficiently supported that would represent in a general way the gas interests of the country.

2. This organization could determine in an authoritative manner mooted questions of a technical character that now exist, or may hereafter arise, in our industry; and might also be instrumental in preventing the formation of so-called competing companies, and in obtaining legislation that would harmonize the interests of the consumers and the companies.

3. After much thought your Committee is convinced that a complete organization cannot be immediately effective; its growth will require time and experience. It is thought that the foundation of the organization may be already laid in the Associations that already exist in several of the States, having for their object the protection and advancement of their mutual interests. And it is hoped that at this meeting of the Association the members present representing companies interested in their State organizations will confer together and consider the expediency of taking prompt action in the direction suggested.

EUGENE VANDERPOOL,
THOS. TURNER,
A. B. SLATER,
A. C. WOOD.
} Committee.

The President—If there is no objection the report of the Committee is received. What action will you take upon it?

Mr. J. P. Harbison—I move the report be adopted, and printed in the JOURNAL, and that the Committee be discharged.

The President—Are there any remarks to be made upon the motion of Mr. Harbison?

Mr. E. McMillin—It is unfortunate that the report was not presented at the beginning of the session, when we would have had sufficient time to digest it. It is now too late to discuss it properly.

Mr. Vanderpool—I will state that some of the members of the Committee did not arrive here until last night, consequently we did not hold a meeting until to-day.

The President—If there is nothing further to be said, I will put the question upon the adoption of Mr. Harbison's motion.

The motion was agreed to, and the President stated that routine business was in order.

VOTES OF THANKS.

Mr. Harbison—One year ago when the Committee on Nomination of Officers for the year now drawing to a close made their report, and in it presented the name of William A. Stedman, of Newport, R.-I., for the office of President of this Association, the members who were personally acquainted with that gentleman knew (when subsequently he was unanimously elected President of our organization) that the proceedings of the year would be conducted with at least as much thoroughness and earnestness as had been those of any previous period in our history; and some of us who knew him intimately felt that our sessions might exceed in value those that "had gone before." I believe, sir, it is the unanimous opinion of the members of this Association, that such pleasant anticipations have been more than fulfilled, and make bold to say that our Twelfth Annual Session stands at the top of the record. There has been a notable increase in our adherence to rules of order, a much greater attention bestowed upon the reading of the papers, and a more generous participation in the discussions than has been witnessed at any of our previous meetings. It affords me, then, very great pleasure to move that a hearty vote of thanks be extended to President Stedman for the most efficient, able and courteous manner in which he has discharged the duties of his office during this session. (Applause.)

The motion was seconded by Mr. Butterworth, put by the Secretary, and unanimously agreed to by a rising vote.

The Secretary—Mr. President, it becomes my pleasant duty on behalf of the members of this Association to extend to you their heartfelt thanks for the very courteous and able manner in which you have presided over the affairs of the Association during the past year.

The President—Gentlemen, I wish to acknowledge what seems to me to be in the nature of an extraordinary courtesy on your part, and to say to you how much I am gratified at this expression of your favor in making such graceful recognition of the manner in which I have filled the Chair. Brother Harbison always had a remarkably keen scent after the good qualities of his neighbors, and a very hearty appreciation of them; indeed I can assure you he is an extraordinarily good friend. I was not, however, aware that I had done anything more than my simple duty, and a twelvemonth ago, when I accepted the office, I promised you that I would do the best I could. Necessarily the great bulk of the labor in preparing for the meeting, in arousing and maintaining the necessary interest among so many widely-scattered members, devolves very largely upon the Secretary of the Association; and I feel that it would be wrong for me to take to myself any large measure of the praise due (if there be any due) for the success of the meeting; and I so say because the gentleman beside me, as your Secretary, has done such hearty, faithful, assiduous and untiring work, that he has entirely surpassed me in my efforts to make this meeting a success. Perhaps it may be an unparliamentary thing, nevertheless I am going to ask you to accord to the Secretary a hearty vote of thanks for his efficient labors on our behalf during the past year, and to that expression of your recognition I desire to add the tribute of my sincere admiration for his work and its result. Since I was in a position to know the amount of labor involved, and of the earnestness and fidelity with which every part of that labor was accepted and performed, and knowing what he has done, and how faithful to your interests he has been, I will ask you to pass a very hearty vote of thanks for the fidelity with which he has discharged all the duties of his office during the past year.

Mr. William Helme—I take great pleasure in seconding the motion of President Stedman.

Mr. Harbison—I desire to add a single word to what our President has said with regard to our worthy Secretary. I had a few minutes' conversation with a member of the Finance Committee right after the Committee had made their report, and after the Treasurer's report had been adopted by the Association. This gentleman informed me that in all the years of his acquaintance with the financial affairs of the Association he had not seen anything to compare with the manner in which the Treasurer's books had been kept during 1884. Now, not reflecting in the slightest degree upon the manner in which our former Treasurers have discharged their duties, I think the complimentary terms which this member of the Finance Committee used in regard to the way in which the books had been kept during the past year should be known to the members of the Association, and that it is due to our Treasurer that a public recognition of his services should be made. The report which was read yesterday was exceedingly creditable in respect of the manner in which the accounts had been kept. It was a very clear and comprehensive detailed statement of the financial condition of the Association at the present time, as well as a record of the business of the past year. I am heartily in accord with the motion.

The President—If there is nothing further to be said, I will put the motion: That this Association accords its hearty vote of thanks in testimony of its appreciation of the signal ability with which the Secretary has conducted the duties of his office during the past year. I think that we can compliment him by a rising vote.

The resolution was unanimously adopted in the manner indicated by the Chairman.

The Secretary—Gentlemen, I am very deeply touched by this kindly expression of your approval, and I can only say to all the members of the Association, and particularly so to the President, that my heartfelt thanks are due.

Mr. S. G. Stiness—Before this Association adjourns it owes it to itself to make some recognition of the very assiduous labors of a most indefatigable Committee of Arrangements, who have so well provided for our comfort and entertainment during our sessions in the city of Washington. I move that the thanks of the Association be extended to the Committee for their attention to our comfort.

The motion, seconded by Mr. Starr, was unanimously adopted.

Mr. William Helme—It is a great source of satisfaction to be able to feel that the Committee of Arrangements are entitled to an expression of approbation for what they have done. As you all know, Mr. Geo. A. McIlhenny is not very well able to get about, and it therefore devolved upon me to do what he would have done had he been in good health. We have done our best, in connection with the Secretary, to make everything satisfactory in so arranging matters that you may have had a pleasant time, and carry with you to your homes a pleasant memory of our meeting in Washington. I hope we may all meet next year with General Andrew Hickenlooper, in Cincinnati, Ohio, where he has promised to show us his new and handsome works; and I have no doubt that his and our expectations in respect to them will be in every way realized.

At this point the business sessions of the Twelfth Annual Meeting were adjourned *sine die*.

[A Paper read before the Society of Gas Lighting.]

Results Obtained by the Removal of the Seal in the Hydraulic Main.

By EUGENE VANDERPOOL.

The paper on this subject recently read by one of our members, and the interest and discussion induced thereby, have led to an examination of the results obtained by the removal of the seal from some of the dip pipes in the works of the Newark (N. J.) Gas Light Company.

Mr. McIlhenny was, I think, the first to invent and use a system for removing the seal, and he was followed at a later day by a great number of men who devised many methods of doing the same thing.

It was claimed ten years ago that by the removal of the seal the following results were to be obtained:

1. A larger yield and improved candle power from the same coal distilled at like temperatures.
2. A greater production of gas per mouthpiece, and a consequent saving in labor.
3. The prevention of the formation of carbon in the retorts.
4. The prevention of stoppages in the stand, bridge, and dip pipes.
5. A greater durability of the retorts.

The results that have been published in regard to the matter are quite contradictory, and the statistics we have are not entirely satisfactory or conclusive.

We put on the dip pipes of a number of our benches the same kind of valves used in the New Haven (Conn.) and some other gas works of the New England States. We have used these valves during a period of six years; and to determine whether there was a saving made by their use, the results obtained from these benches have been taken and compared with those obtained from other benches of the same general construction, and fitted with retorts and fire material made by the same manufacturer.

When using the valves a pressure of three-tenths of an inch was always maintained in the retorts fitted with them, the seal of the other retorts varying from three-quarters to one and a half inches. It has been found that the benches in which valves were used, when working at the same temperature as those under seal—

1. Carbonized more coal, and gave, consequently, a greater production of gas per mouthpiece.
2. That carbon was not deposited so rapidly.
3. That there were not so many stopped pipes.
4. That there was a scarcely estimable improvement in the quality of the gas.
5. That the retorts did not last as long.

To determine the economy, if any, obtained by the use of the valves, it is necessary to state the results obtained and the cost thereof, both when the valves were used and when not used.

Results Obtained with Valves.

Size of retorts, 14′ × 25′ × 8′ 6′, set in benches of 5's.

Number of days benches ran before resetting (average)..	593
Cubic feet of gas made per retort in lifetime (average)...	4,094,620
Numb r of hours each retort out for carbon (average)....	1,436
Cubic feet of gas made per retort in 24 hours.....	6,904

Results with Seal.

Size of retorts, 14′ × 25′ × 8′ 6′, set in benches of 5's.

Number of days benches ran before resetting (average)..	899
Cubic feet of gas made per retort in lifetime (average)...	5,850,000
Number of hours each retort out for carbon (average)....	4,089
Cubic feet of gas made per retort in in 24 hours.....	6,508

It is necessary to show the cost of building and running a setting of five retorts at a working heat, in order to determine the cost and value of each retort used.

Cost of a Setting of Five Retorts with Ordinary Furnace.

Cost, per retort, of skeleton.....		$64 00
" "	filling in..	45 00
" "	taking down and erecting iron work...	10 00
" "	iron work.....	60 00
		$179·00

The amount chargeable to wear and tear of the skeleton per diem, when bench is under fire, is reached as follows: The skeleton should last twenty years, and the old material, when skeleton is torn down, is worth one-third its cost at time of erection—which makes 3 cents as the amount chargeable per diem when bench is under fire; and the cost of running a bench of fives at a working heat is as follows:

Cost of Running a Bench of Fives at a Working Heat, including, 1, fuel; 2, labor; 3, wear and tear of skeleton; 4, wear and tear of iron work—including ashpan, grate bars, furnace door, tools, and mouthpieces.

1. Fuel—60 bushels coke, at 7 cents.....	$4 20
2. Labor, at $2 per diem.....	45
3. Skeleton.....	03
4. Iron work.....	25
Total.....	$4 93

Cost per diem of each, 98.6 cents.

It is clear that, with the above expense remaining constant, there must be a saving when the production per mouthpiece is increased, as is the case where the valves are used, and to the following extent:

Cost per 1,000 cubic feet when retort makes 6,508 cu. ft., $\frac{986}{6508} = 15.15$ cents.

" " " " " 6,904 " $\frac{986}{6904} = 14.28$ cents.

Saving per thousand cubic feet due to use of valves.... 00.87 cents.

It is also found that the saving by the use of the valves, caused by the lesser production of carbon, amounts to .30 of a cent per thousand cubic feet.

The saving due to the fewer stopped pipes is not estimated; and this is also true of the improvement in the quality of the gas.

The gain due to the valves amounts to 1.17 cents per thousand cubic feet; from which must be deducted the extra cost of replacing retorts, amounting to .44 of a cent, and the wear and tear of valves and interest on their increased cost over the ordinary dip pipe, amounting to .02 cent—or .46 of a cent in all.

This will leave the net saving due to the use of the valves at .71 of a cent per thousand cubic feet.

It must be borne in mind, however, that this saving was reached in working against an old-fashioned hydraulic main that sealed the dip pipe from three-quarters to one and a half inches; and it is clear the saving would not have been as great if a large main could have been used and the seal was not one and one half inches.

The valves require considerable attention, and complicate the working of a retort house; and the saving under the most favorable conditions is so small that in the designs for larger settings the writer has concluded to adopt a large hydraulic main and a light seal in preference to the valves.

The Teaching of Experience in "Competition."

By Antiquus.

The "consumer" is living and learning. So many manifestations of anxiety for the welfare of those who compose that down-trodden and unfriended class were recently made that actually they (the "consumers") began to believe they were of some new importance in the community. So accordingly they aided their friends and champions in establishing "consumers'," etc., gas companies, which should have especial care for them, and furnish extraordinarily cheap, and wonderfully good, gas. Those efforts were in many cases successful. For a time the consumers enjoyed a millenium; but soon they began to find themselves dwindling in importance. They discovered they had been but means to ends for other than their own welfare. The "consumers" company which had been established repudiated the consumers, joined hands with the much-decried grinding monopoly of the old gas company, and raised the price of gas to a figure generally above what it formerly was, or at least above what it would have been in the natural plan of reduction followed by the old company. That course of experience has been gone through with time after time by the "consumer," until we almost weary of the story, and are exasperated at the want of perspicacity on the part of these people who will not look beyond their own doors. With the history of the gas companies of our country teeming with examples of the inevitable results of such action, we see it repeated with the belief that such results shall not be.

But, finally, in some places this universal experience is being considered. The "consumer," as we said, is living and learning that "all is not gold that glitters." We have in mind a recent case at Hudson, N. Y. Last spring the citizens and "consumers" of that town were visited by a cheap, "competitive" gas delegate—water gas, of course. The "new gas" was promised twenty per cent. cheaper, and twenty per cent. higher in candle power, than the old "coal gas" now being sold there. All the familiar attractions were held out. The city fathers were wined and dined, and put through the usual course of treatment. At all this the Hudson Gas Company, the long established source of gas supply, felt little alarm. They stated their case very simply and succinctly. They said to the city fathers: "Look about you," and asked them to consider the experience of others in these cases. They looked, it appears, and they pretty thoroughly gauged the benefits other towns and cities had derived from the blessings of "better and cheaper gas" and "competition." Evidently, the citizens of Hudson wanted no experience with "consumers" gas companies; for when, after full and long discussion of its merits, the question of granting the petition for the new competitive water gas company came finally before the Town Council this fall for decision, the councilmen voted promptly and unanimously, "No!"

That New Use for a Residual Product.—In our "Item" columns of last issue we published a statement that Mr. O. B. Monnett (of the Bucyrus, Ohio, Gas Company) had obtained letters patent on a "sheep wash" preparation that was manufactured out of a "waste product" from gas manufacture. We also extended to Mr. Monnett an invitation to give our readers

the benefit of a description of the new compound. This the gentleman does not seem disposed to do, but he informs us that we may say the "wash" is entirely made up, as to its components, from the spent lime of purifying boxes. Mr. M. claims that the price received for the preparation will much more than repay the original price paid for the lime. He does, however, confess his willingness to impart any desired information to those who will address him personally, or by letter, on the subject.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

LONDON, Dec. 10, 1884.

In reference to the discussion on recuperation in connection with generator furnaces, which has been carried on in the correspondence columns of the *Journal of Gas Lighting* for some months past, and has extended to something over 100 letters, the suggestion to which I referred in my letter dated Oct. 10th, that the matter should be thoroughly investigated under the auspices of the Gas Institute, has not received the support of the Council. At a meeting held on the 21st ult. the subject came up for discussion, and after an animated debate the following resolution was passed: "That the Council do not consider it desirable that the question of regeneration as applied to the heating of gas retorts should be investigated by the appointment of a Research Committee at the present time." This decision leaves it an open question whether the subject was not considered to possess sufficient importance; or whether owing to the position of the Council as regards the proposed alterations in the rules they did not feel themselves at liberty to appoint a Research Committee for any purpose. The discussion above alluded to has brought out some communicated articles in connection with the subject; and the careful experiments made by Mr. Trewby, and those by Mr. Harold B. Dixon, may be specially mentioned. Some half dozen different and independent investigators have now tried experiments on the subject, and they all take up an opposite position to Mr. Valon. This gentleman passes a current of air very slowly through a red-hot tube, and says that it is not raised in temperature to any appreciable extent by that process; and his practical deduction is that the air passing through the secondary air channels of a regenerative furnace *is not heated*. But in arriving at this result he stands alone. The other experimenters find that the air is heated to nearly if not quite the temperature of the red-hot tube. One thing seems certain—if the regenerative arrangement does not heat the air, it secures economy of fuel in a manner at present not understood. Mr. Valon admits a saving of 16 per cent. of fuel by its use; so gas engineers will do well to adopt a generator furnace with recuperative channels in their retort-house, and so enjoy the saving of fuel and other advantages that are thereby obtainable. They can then read the interesting information which Mr. Valon and other gentlemen interested in the matter so good-naturedly publish for the benefit of the profession at their leisure. Whether his conclusions are right or wrong, Mr. Valon is entitled to our thanks for submitting his views to general criticism and discussion. Although not countenanced by the Gas Institute, the matter is not likely to drop, and further useful information on this important subject may be confidently looked for.

The Rev. W. R. Bowditch, who died on the 16th ult., was noted, some fifteen or twenty years since, for the attention which he bestowed upon the philosophical and scientific department of the gas industry. His book, entitled: "The Analysis, Technical Valuation, Purification and Use of Coal Gas," is at the present time held in great repute as one of the standard works for the profession; and his views on the subject of condensation, purification, etc., have been proved by experience to be perfectly sound and correct. The opinions laid down in the book above named, which was published in 1867, fairly represent the principles of gas engineering practice as carried on at this day; and the late Rev. W. R. Bowditch may be classed with Dr. Henry, of Manchester, and Mr. Lewis Thompson, forming a trio of philosophers that occupy a conspicuous position on account of the painstaking investigation and scientific ability they applied to the subject of illuminating gas. Among the special items in respect to which this gentleman anticipated actual practice by several years, I may mention three that have recently attracted considerable attention—viz., the regenerative gas burner, the Albo carbon light, in which the light afforded by a small gas burner is increased some five-fold, by the use of naphthalene as a carburetter, and the substitution of an artificial gaseous mixture as a standard for photometrical observations, in the place of sperm candles.

Some of our leading scientists have talked of the time when coal gas will be regarded as an insignificant by-product, and the primary object of distilling coal will be the obtaining of tar, ammonia and coke. The recent state of the market as regards tar products, and also ammonia, is scarcely such as to further the fulfilment of this prophecy. To some extent, however, the dream has been realized in fact. The Whitwood Chemical Company, situated in one of the best coal producing parts of England, has for some time past been distilling coal to the extent of something over 1,000 tons per week, for the production of coke, tar, and ammonia. The gas produced concurrently with those products is of an inferior character, scarcely suitable for lighting; but, of course, available as a source of heat. After heating their retorts, boilers, etc., they have still a quantity of gas to spare, and they advertise that they are prepared to supply this at the low rate of 6d. per 1,000 cubic feet, the purchaser to provide the means for removing the gas. It remains to be seen whether this offer will induce factory or mill owners in the neighborhood to use gaseous fuel in the place of coal or coke, or whether it will prove a sufficient attraction to enterprising users of fuel to induce them to pitch their tents within hailing distance of the Whitwood Chemical Works. The weak point of these cheap gas schemes is the cost of distribution and storage. In ordinary gas undertakings the annual cost of distribution and storage, which comprises interest on capital, and the expenditure necessary for maintenance and repairs, amounts to something like 6d. per 1,000 cubic feet. This is not an important item in the case of illuminating gas of fair quality, but assumes stupendous proportions when applied to cheap gas suitable for heating purposes only. Heating gas of inferior quality supplied from a main tap, at atmospheric temperature, is a different thing to heating gas direct from the outlet of the generator without being allowed to cool. Even if ordinary gas could be made at no cost—that is to say, assuming it to be a by-product, pure and simple—it could not be profitably distributed in this country for less than about 36 cents per 1,000 cubic feet.

The closing scene in connection with the "gas section" of the International Electric and Gas Exhibition, at the Crystal Palace, which was held during the winter of 1882-3, has just been enacted by the holding of the closing meeting of the General Committee on the 25th ult. It will be remembered that the Gas Institute took up the position of seeing that the "gas section" of this exhibition was properly carried out in a manner calculated to advance the interests of the gas industry. They sent a circular to all the gas undertakings throughout the country, requesting aid in meeting the necessary expenses, and in reply received a liberal amount of support. They estimated their requirements at £5,000, and in reply they received guarantees from some 200 subscribers, gas companies, for the greater part, but including some private individuals (amongst whom I am pleased to notice the proprietors of the AMERICAN GAS LIGHT JOURNAL.) Of this the sum of £4,426 has actually been called up and expended, and it is estimated that after paying all claims a balance of some £800 or £900 will remain, which will probably be returned, *pro rata*, to the subscribers. When it is remembered that, in addition to meeting the expenses attendant upon the getting together of the exhibits, etc. (the expenditure includes the cost of a very elaborate series of experiments for ascertaining the actual practical value of the various appliances exhibited, and the embodying of the same in the form of a report, a copy of which will be forwarded to every subscriber), it is evident that the General Committee have carried out their undertaking, not only in a fairly satisfactory, but in a very economical manner. They could not have attained such a result but for the assistance that has been so freely volunteered; such, for example, as the action of the South Metropolitan Gas Company, in placing a set of rooms and a gasholder full of gas at the disposal of the testing engineers. It is perhaps to be regretted that more expedition was not brought to bear on the carrying out of the tests, the publication of the report, and generally in the closing up of the affair. Events move so rapidly that in the period of eighteen months or so that has elapsed since the closing of the exhibition, many will have forgotten the circumstances which led to its formation. The interest attaching to the report is somewhat dulled by the fact that a considerable portion of the matter comprised in it has already leaked out in some form or another.

Of the report itself I need not say much, as it will, no doubt, be reviewed in due course. It comprises an octavo volume of 185 pages, while the 41 tables referred to, and included in it, are given in the form of a separate volume of equal size. The principal features are Mr. F. W. Hartley's report on the calorific power of the gas used for the experiments; Messrs. Dibdin and Foster's report upon gas burners; and the bulk of the work is occupied by a very elaborate series of experiments upon the heating and cooking stoves, carried out by Mr. D. Kinnear Clark. It is interesting to notice that, while most of the heating stoves realize 90 per cent. and upwards of the calorific value of the gas, the roasting stoves only realize about 16 per cent. In the latter it is found that no less than 80 per cent.—four-fifths of the total amount of heat produced—is carried off by radiation and conduction; so there is evidently room for considerable economy as regards the use of gas for roasting. The report is scarcely the sort of work that one would take up to read for recreation in an idle moment; but it is no less valuable on that account as a work of reference, and is to be specially recommended to the careful consideration of makers of gas stoves and appliances.

The year that is now drawing to a close has been a prosperous one for gas undertakings, although it has been free—perhaps unusually so—from specially prominent events. The advantages of using gas, not for lighting alone, but for heating and cooking, and also—in localities where the price is not

more than eighty-four cents per 1,000 cubic feet—for gas engines, and in connection with several technical processes, are becoming more and more prominent each year in the public estimation. Gas engines are now made which can be depended upon to run satisfactorily, with a consumption of something less than 25 cubic feet of gas per horse power *used* per hour. (I put the word "used" in italics because if the gas engines are not worked up to their maximum power, they use proportionately less gas.) Thus, with gas at a price of eighty to eighty-four cents per thousand cubic feet, a ten-horse power engine can be worked, for a working day of 10 hours, with a consumption of 2,500 cubic feet, costing not much more than two dollars per day. Half of this sum at least is saved in wages as compared with the cost of providing a similar amount of power by the medium of an ordinary steam engine and boiler. It is also found that the gas engine can be used in certain localities—such, for instance, as in the basement of a warehouse or store abutting upon a principal street, and surrounded with houses—where the steam boiler is objectionable. Turning to working a kitchen range, kept burning all day, in size sufficient to provide for about twenty people, will not use less than one cwt. of coal per day, costing from 16 to 20 cents, according to the locality; a gas stove can be used to prepare breakfast, with a consumption of not more than 20 cubic feet, or dinner, with a consumption of 50 to 60 cubic feet, say, 100 cubic feet for the day; and this is only about half the cost of the coal, to say nothing of the other advantages. As regards heating, gas is scarcely so economical as coal for maintaining the temperature of a room continuously from morning to night, but is found very useful for offices, libraries, drawing-rooms, or other apartments that are only required for an hour or two at a time. And where expense is no object it is used as a means of avoiding the smoke and dust inseparable from an ordinary coal fire. In respect to the original purpose for which gas was intended—that of supplying artificial light—a very great improvement is noticeable within the last few years in the quality of the burners and accessories used; thus the consumers get more value out of the gas; for, with the improved appliances, they can either have more light, or use less gas, as compared with the results afforded by the iron fishtail burner, and ground or slightly variegated glass globe that were formerly in general use. Consequently not only has the use of gas increased, on account of the additional demand for cooking stoves, heating stoves, and gas engines, but there is also an increased demand for lighting; and this in spite of the very great improvement in candles and lamps, and the introduction of cheap oils and petroleums into the market.

The market for materials—coal and iron—has been fairly tranquil; but a depression has been noticeable in regard to all the residual products. A low price for coal, of course, means a corresponding reduction in the price of coke; certain products from tar have fallen in value, thus affecting the price of tar; and ammonia, though in a low state at the beginning of the year, has got worse instead of better. But with a good demand for gas, and coal at low prices, the residuals are only of secondary importance.

In concluding my last letter for the year 1884, I may be permitted to express my best wishes that the AMERICAN GAS LIGHT JOURNAL, and all its readers, may enjoy the advantages attendant upon a bright, happy, and prosperous *New Year*.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

CORRECTION IN REGARD TO THE WILBRAHAM EXHIBIT AT AMERICAN INSTITUTE FAIR.—In our article on the American Institute Fair display, published in issue of Dec. 16th, one or two mistakes were made, and the errors happened in relation to the particulars concerning the Wilbraham Bros.' exhibit. The No. 5½ Baker Pressure Blower on exhibition was a specimen of that machine intended for furnishing blast to cupolas and charcoal blast furnaces—in short, general smelting operations at foundries. The No. 5½ blower has a displacement of 30 cubic feet per revolution, and is suitable for a cupola 49 to 56 inches diameter inside the lining. It will furnish feed for the hourly smelting of from 7 to 10 tons of metal, and can easily supply a pressure of 60 ounces per square inch. This will be rated as somewhat of a higher order of duty than that assigned by us to the machine in our former note on the subject, wherein it was said the No. 5½ instrument would furnish blast for 50 smiths' fires. It would undoubtedly perform that duty, but we opine that there would also be fifty "anxious smiths" hunting coals in a lively fashion around their forges. The mistake in our rating happened through an inadvertence in hastily marking a copy of the Wilbraham catalogue for future reference. This catalogue, in specifying the various capacities of the machines, lists two series of apparatus—one intended for foundry purposes, the other for smiths' use—and the numbers of both classes begin at 1 and end at 7½ in each case, hence the mistake. Of course, this reference to the "lists" is not offered as any sort of apology for our error, but is mentioned as showing the cause that led to the "mixing up;" and is further submitted as evidence that we had no intention of "belittling" the power of the "Baker Pressure Blower." Indeed, even were we so maliciously inclined, our efforts in that line would "avail us nothing," as that apparatus has made its sterling value known over and over again. The second error in regard to the exhibit was the statement that Wilbraham Bros. had recently furnished an exhauster to the Northern Liberties Gas Light Company, of Philadelphia, Pa. It should have read that the machine was constructed to the order of the Philadelphia Gas Trust, and by them erected at the works located in the Twenty-fifth ward of that city. Messrs. Wilbraham claim that this exhauster has the largest working capacity of any yet erected in this country. The same firm also furnished an exhauster to the Wilmington (Del.) Gas Light Company, which goes to show that Brother Curley is up and doing; but, then, who ever knew "Brother Tom." when he was inactive?

AND WE HAVE TO ACKNOWLEDGE ANOTHER.—Still, this can hardly be set down against us, as the information concerning the matter was received in the most direct manner possible. The error occurred in the "Item" about the asbestos drop curtain, ordered for the Philadelphia (Pa.) Academy of Music, in which it was stated by us that the proportion of material in its make up was in the ratio of one-third cotton fiber to two-thirds asbestos fiber. The Chalmers-Spence Company write us to say that the correct composition of the curtain is in the ratio of 3 per cent. cotton to 97 per cent. asbestos—even that small per cent. of cotton being only employed on account of certain purely mechanical advantages desired, and its presence does not in the smallest degree affect the absolute fire-proof quality of the material.

WHY THE ACCIDENT OCCURRED IN THE VALVE-HOUSE OF THE WORCESTER (MASS.) GAS LIGHT COMPANY.—In our number for December 2d it was related that Mr. J. H. Rollins, Agent and Superintendent of the above named company, had occasion to display his courage in a rather striking manner on the evening of November 18th last. No one acquainted with Mr. Rollins would be surprised to learn that he was and is possessed of every requisite (physical and mental) to draw upon in cases of emergency, and those of the fraternity not acquainted with him personally will no doubt agree with us that it requires no mean order of courage to "battle with fire," let alone to come out first-best in the heated contest. It now transpires that the primal cause leading to the burning of the Worcester valve-house may be traced to a sudden stoppage in one of the scrubbers. When this stoppage occurred, naturally enough, the exhauster was bound to drive the gas somewhere, and it is supposed that the weakest point of resistance encountered was at the seals of condenser drips, and thus on to sewer connection from same. The valve-house destroyed, containing valves, gauges, governor, and a 100-light meter, was also connected with the sewer by means of a four-inch pipe into which was pumped the holder drips. It is supposed that the gas, passing into the sewer, found its way speedily into the drain connection in valve-house and there took fire, with the consequences chronicled in issue of December 2d. The boy who first made the discovery of how things were going (a lad named Reynolds) has entirely recovered from the injuries received, but Mr. Rollins was rather more unfortunate in his experience. We are more than pleased, however, to say that he is all right again, although Rollins is certainly convinced he is hardly qualified to appear as the possessor of all the requisites going to make up the invulnerability credited to a salamander.

PHILADELPHIA (PA.) GAS TRUST CONTRACTS.—Last December the Committees in charge of such matters made the following contracts in regard to the items below specified: The contract for purchase and removal of carbon on hand at the various stations was awarded to M. G. Henning, of 1152 Beach street, at a stated price of $5.25 per ton of 2,200 pounds. Pipe contracts were made with the Gloucester Iron Works to supply 15,000 lengths of 4-inch, at 23 cents per foot, and fittings for same at 2¼ cents per lb.; with the Mellert Foundry to supply 3,000 lengths 3-inch, at 17½ cents per foot; 550 lengths 12-inch at 84 cents; 55 lengths 20-inch, at $2.10, and fittings for lot, at two and two-fifths cents per lb. The money value of awards foots up, in first case, to about $45,000; in second to about $14,800.

NOTICE OF REMOVAL.—The old headquarters of the Chicago Retort and Fire Brick Works (Mr. Geo. C. Hicks, President), has been removed from the old location at No. 79 Dearborn street, Chicago (Ills.), to the factory buildings at 45th and Clark streets, same city. Post office address is "Box 489."

METROPOLITAN COMPANY, BROOKLYN, N. Y., REDUCES SELLING RATES.—From and after date of January 1st, 1885, the rates charged for gas by the Metropolitan Gas Light Company were adjusted to the following schedule, as per notification of the company's Secretary, Mr. C. H. Stoddard: To consumers of 50,000 cubic feet and upwards per month, $2 per 1,000; to consumers of less than 50,000 cubic feet per month, $2.25 per 1,000.

THE USUAL NEWSPAPER STYLE OF PREDICTION.—A daily newspaper might have some sort of an excuse for going into lively hysterical symptoms

when some one of its "great-headed" staff saw fit to enlighten (?) its subscribers on the subject of gas and gas companies, but we had rather looked for better and more rational sort of treatment from the hands—and pens—of the gentlemen in control of the publication known as the *Western Manufacturer*. Still, our western contemporary saw fit to indulge in the following pessimistic declaration on the subject of "monopoly:" "The act passed at the last Legislature of New York, giving the gas companies of New York city power to consolidate, has been acted on, and all but two companies have formed a gigantic pool—united in one great corporation with a capital stock of $40,000,000. The citizens of New York will soon find out that the sole purpose of this combination was not, as some were led to believe, for the purpose of reducing the price of gas, but it was solely for the purpose of advancing the price and keeping out any gas company that may wish to begin business in the city under an agreement to furnish gas at a marked reduction from the rate now charged. Individuals or corporations who acquire a monopoly of any commodity regulate the price thereof to suit themselves and not the public. Combinations are always formed for gain—with the intent to beat some one. When the reverse of this is the case, the millenium is close at hand." The *Western Manufacturer* had better put a curb upon the license of its prophet; but somehow or another this always was a bad country for those who essayed the role of soothsayer. Maybe the millenium is close at hand upon the residents of New York, but to those living therein that delightfully fraternal period seems about as remote now as it ever has been. Certain it is the first thing the "combination" did was to reduce the selling price of gas here by 75 and 50 cents per thousand, and if it had not been for the fact that knavish legislation made possible in the past the future existence of redundant gas companies, New York's citizens might now be enjoying gas at $1.25 per thousand. The *Western Manufacturer's* prophet had better remove to Philadelphia; he will have companions there.

The Louisville (Ky.) Gas War.—Mr. John G. Baxter, President of the old Louisville Gas Light Company, has given the word to commence operations against the corporation known as the Citizens Company, which concern will be ready to deliver gas to consumers on or about the 1st of February. The peculiar arrangement made with the old Louisville Company by the municipal authorities, when its charter was originally granted, as well as its subsequent modifications, would naturally enough be supposed to afford a perfect guarantee against the establishment there of any competing gas corporation. As we understand the case, the city of Louisville owns outright about one-half of the stock (total capitalization is 1½ million dollars) of the old company, and the dividends received thereon (the amount of annual dividends is restricted by law) have more than paid for the expenses incurred in lighting the street lamps; the charter of the old company obliges it to lay a certain length of new conduits each year, and this obligation has caused the expenditure of thousands of dollars upon which no interest money has ever been returned; the instrument also provides that the city's lights shall only be charged for at cost of same to gas company, as shown by the books of the company. Notwithstanding all this, a certain sort of scheming capitalists made application to the municipal authorities for a grant to operate an opposition works, and were finally successful. We believe that F. D. Carley, a gentleman more than likely rather closely identified with Chess, Carley & Co., who in turn are popularly supposed to be the chief agents, in the near Southwest, of the famous isopod—for we incline to the opinion that our readers will agree with us in the assertion that the legs of the Standard combination are all alike—is the chief financial spirit in the Citizens Company, and is, of course, only acting for the relief of the oppressed Louisville gas consumer. There are some who will feel disposed to claim that Mr. Carley and his coadjutors are engaged in the enterprise for the sake of the shekels that may be gleaned, and more than likely Mr. Baxter is included in the doubting list. Mr. B. certainly has some excuse for being a trifle suspicious, and particularly so when he recalls to mind various propositions submitted to his consideration at divers periods by the Citizens' backers. Now, be it remembered that Baxter is a Kentuckian, and that he has also gathered around him in the management of the Louisville Company other Kentuckians, who do not exhibit the least symptoms of fear when the war tocsin is sounded, but rather like the tones which usually grate so harshly on timorous ears. The Citizens combination having almost gotten to the point when the operation of distribution would commence, Mr. Baxter though it would be a good idea to fight the enemy with fire; and accordingly early in December he caused a notice to be published in the newspapers of his city that on and after January 1st 1885, the price of gas sold by the Louisville Company would be reduced to $1 per thousand, in consideration of prompt payment of bills. The Citizens Company has laid but about ten miles of mains, and these, of course, have been laid through the heart of the territory; and the Louisville Company, in making the reduction, might have followed the course usually pursued in such like cases, by having the decreased price only apply to the consumption in the district piped by the invaders; but this practice (and very wisely) was not adhered to—the decreased rate applying to every part of the city. When the announcement was publicly made, the Citizens' managers put on a bold front, and declared that their price for gas, when distribution should be commenced, would be at a lower figure than that of the old company. They proclaimed that if the Louisville Company should reduce its price to fifty cents per thousand the Citizens Company would come down still lower, and furnished the usual assurance that at all times would they supply, dollar for dollar, a richer illuminant than that of its (exact word in the advertisement) *competitor*. Of course the Carley concern proposes to operate a water gas system; hence the value of its candle power over that of its "competitor," comparative cheapness, etc. It is amusing to contrast all these claims with the evidence collected by Mr. Baxter and the Louisville Company's Engineer, Mr. A. H. Barret, when on their trip East last summer, in regard to the value of water gas. In an interview between Mr. Baxter and the reporter of a Louisville daily paper, concerning this very matter, Mr. B., in reply to the question as to whether he had investigated the cost of making water gas, replied: "The Louisville Company has fully investigated the subject, and has found that water gas cannot be manufactured in this city as cheaply as coal gas. It long ago had an opportunity to purchase water gas patents at very low figures, but refused to do so, not only on account of the cost of production, but also of the impurity of the gas and the danger attending its use."

The Louisville Company, even before the reduction, was gaining consumers at the rate of about 50 per month; and so it will be seen that its position in the strife is most favorable. As an example of the manner in which the plant of the Citizens Company is constructed, we might mention that at three different points on the ten miles of mains already down four drips may be counted on a length of 200 feet. Unaccounted-for gas ought to figure as somewhat of an item in the neighborhood of the bookkeeping department. The taxpayers of Louisville will have the pleasure of being assessed in the neighborhood of $60,000 for public lighting for 1885 in case the old company is obliged to pass its dividends—and they will of necessity be passed while the "fight" is in progress. Yet they (the taxpayers) will have the solace of knowing that their City Fathers, or whatever other owlish assemblage of lawmakers as may have granted the opposition charter, are responsible for the imposition of the burden. We will keep track of "how the slaughter goes."

Death of Mr. W. B. Warren.—We regret the necessity that compels us to chronicle the death of Mr. W. B. Warren, who for the past sixteen years has been the executive head of the Terre Haute (Ind.) Gas Light Company. The sad event occurred at half-past ten o'clock on the morning of December 16 last, and was all the more sorrowful from the manner of its suddenness. While walking along Fourth street at the hour mentioned, Mr. Warren staggered and fell to the sidewalk. He was instantly removed to the store of Mr. Meyers, and a messenger was sent for Dr. Swafford, who responded immediately, only to pronounce the patient dead. Mr. Warren was born in Jefferson County, New York, in the month of April, 1816, and first became a resident of Terre Haute in the year 1834. He was then a poor young lad, but bright, energetic, and enterprising. Careful in his habits, prudent in his speculations, and business-like in his commercial forecasts, it was not long before he amassed a competence. In 1850 Mr. Warren was united in marriage with Miss Sue Whitcomb, and this lady, with a son (Dr. Louis Warren) and a daughter survive him. In 1868 the now deceased gentleman was elected to the presidency of the Terre Haute Gas Light Company, and it is due to his sagacity and public spirit that the corporation holds such a secure place in the confidence of the citizens. Mr. Warren leaves to his children not alone a plethora of this world's goods, but also that which will now most console them in the dark hour of sorrow at his unlooked for taking-off—the heritage of a name loved and respected by one's fellow-citizens.

The Montreal Plumber Escapes Punishment.—Some time ago we had occasion to report an explosion of gas that resulted fatally to a domestic in the employ of Mrs. Hutchins, of Montreal, Canada. It is not necessary to repeat the particulars of the unfortunate affair, as the account of same was published in the Journal of Nov. 17. The coroner's jury that investigated the matter held a plumber named Brennan guilty of manslaughter for his carelessness in making a gas connection to a cooking stove in the house of Mrs. Hutchins, which was the primal cause leading to the fatal explosion. This proceeding on the part of a coroner's jury was so unusual (in that it was just and sensible) as to cause us to think that others of his ilk might in time be made to feel the weight of the law when their negligence would endanger life or property. The attention of the Grand Jury in session at Montreal on a late date was directed to the finding of the lesser jury; and, unfortunately for the safety of the community, the investigation by the superior body developed the fact that no law existed whereby such cases could be reached, and so a verdict of "no bill" was returned. It is a pity that this is the final outcome of the affair, for if ever a plumber deserved punishment (and whoever knew one of that famous craft that always did what was right?) it was the man Brennan.

A Gasholder Collapses.—One of the old gasholders belonging to the St. Louis (Mo.) Gas Light Company collapsed on the night of Dec. 11. At 9:30 P.M. on that date two of the iron girders snapped, and two hours later the grand crash came. The holder sheets, columns, etc., fell flat into the tank, and none of the other holders were in any way injured. The ruined holder previous to its demolition contained an estimated content of 360,000 cubic feet, and this vast accumulation was ignited; the resultant illumination, which lasted about 20 seconds, was one of the grandest sights ever witnessed in St. Louis—but it was a terribly expensive spectacle. The total loss is placed at $100,000. No damage was done to any of the surrounding property. The particulars received by us in regard to the affair have so far been of the most meagre sort, and we would call upon Engineer T. G. Lansden for a straight account of the trouble. The temperature of the atmosphere, we believe, experienced a very sharp decline in that locality on the day in question, and this sudden change in weather conditions may have had much to do with the snapping of the girders. We are informed that the holder was in use for about 27 years.

The Proper Way to do It.—The Youngstown (Ohio) Gas Light Company may be fairly assigned the banner position in the matter of public spirit and liberality in dealing with its consumers, all things being duly taken into consideration. The 1884 rates were low in every sense of the term; but Mr. Geo. Cornell, Secretary and Treasurer of the company, figured out to his own satisfaction, and speedily brought his board of directors around to his own way of thinking, that even the selling rates of '84 could be still further decreased with profit to the company during '85. At a board meeting recently held the subject was thoroughly canvassed, and the result of the deliberations was made manifest to the people of Youngstown in the shape of the following circular, bearing date of Dec. 22d, 1884: "Although the year 1884 has been one of severe depression in business, the people of Youngstown have given us a steady, liberal and increasing patronage. We desire to make a practical acknowledgment of our indebtedness to them by the following subetantial reduction in the price of gas, to take effect on the first day of January, 1885:

	New Rate.	Old Rate.
A monthly consumption of less than 5,000 cu. ft.,	$1.50 per M.	$1.70
" " from 5,000 to 15,000 "	1.40 "	1.50
" " " 15,000 to 25,000 "	1.30 "	1.40
" " " 25,000 and upward "	1.20 "	1.30

Being a reduction of 20 cents per thousend cubic feet to the first-class (or smallest consumers) and ten cents to all others.

"We do not know of any city of 25,000 population in the country, and but few cities of any size, in which the price of gas has been reduced as low as at Youngstown, and we hope by this liberality and enterprise to retain our old patrons and secure many new ones." Youngstown Gas Co.,
"Geo. Cornell, Sec'y and Treas."

These figures speak for themselves, and furnish the most cogent sort of proof that enterprise and liberality mark the spirit which guides the doings of the "man at the helm" of the Youngstown Company. The handsomely gotten up circular making public the new rates, also contains within its cover an invitation to all interested in the lighting of halls, churches, warehouses, or other situations requiring powerful illumination, to investigate and examine into the merits of the Siemens burner for satisfactorily performing such work. It gives the names of the places so illuminated within the precincts of Youngstown, and asks that critical study be made of the lighting effect obtained by their agency, and also the cost of their maintenance. The following places there have already installed the Siemens lights: Manning, McKeown & Co., one of 500-candle power; Plymouth Congregational Church, one of 500-candle power; Youngstown Roller Skating Rink, two of 500-candle power each; under contract with the managers of the Great Western Roller Skating Rink for two of 500 and two of 250-candle power each. Every company in the country can get similar places in their cities to install these large burners if they will only make the effort. In conclusion we are bound to add that the Youngstown folks are bent upon making the New Year pleasing to the gas consumer and prosperous for themselves. Keep up the good work, for good example is bound to be infectious.

Correspondence

[The Journal is not responsible for the opinions expressed by correspondents.]

A Wise Body of Municipal Councilors.

Trenton Gas Light Company,
Trenton, N. J., Dec. 24, 1884.

To the Editor American Gas Light Journal:

Among the "Items of Interest from Various Localities," in the Gas Light Journal of Dec. 16th, is one headed, "Electric Light for Trenton's (N. J.) Streets," which states that the streets of Trenton are lighted with gasoline lamps because the city will not pay for gas.

There is a great mistake in the information that has reached you in that particular, which, out of respect to the Common Council of this city, I feel it my duty to set right, and which I am sure you will be glad to correct. Gas has always been burned in the street lamps of Trenton, on the lines of the mains of the Gas Light Company since the starting of the gas works here in 1849; and the city is now about as well lighted as most places of its size, by gas lamps burning all night and every night in the year.

The city maintains a number of gasoline lamps; but in all cases they are placed where there are no gas mains. As soon as mains are laid in a street, gas takes the place of the gasoline, and the gasoline lamps are put up in other places where the mains do not extend. No pretence of preference for gasoline lamps has ever been made by the Common Council; but such lamps have been used as the best substitute where gas could not be had, and their use in that way only shows the willingness of the city authorities to accommodate all parts of the city to the best of their power, and by no means betokens any prejudice against the Gas Light Company. It would be premature to speak with reference to the electric light company, as it is not yet in operation; and, indeed, it has no bearing on the error I wish to correct.

Yours truly,
John S. Chambers, Gen'l Manager.

[We are more than pleased to give space to the above, and acknowledge our indebtedness to Mr. Chambers' courtesy in so speedily setting us aright on this matter. It is gratifying to note that Trenton's Council is governed by a public-spirited policy in the matter of street lighting, for, as Mr. Chambers well knows, the reverse of the case is the usual rule in this country. Our informant in the Trenton lighting case had no reason to convey to us untruthful information; but possibly his imagination was rather vividly excited, and so the real circumstances were badly distorted.—Ed.]

The Market for Gas Securities.

Nothing of any particular moment or importance has been developed during the fortnight in regard to dealings in New York city gas shares, although Equitable stock moved up rather strongly. This company is now sending out gas to consumers, and those in authority in the corporation appear very hopeful as to the future outlook. At the time of writing (Dec. 31) Consolidated shares are freely offered at 85, the best bid price that we have record of being 82½. Brokers are, as a rule, "bearish" on the security, and one pretty well-informed investor has promulgated the opinion that Consolidated will see 75 quicker than it will par. In spite of the bearish arguments advanced we still adhere to the opinion that Consolidated is a decided purchase at 85, and advise those inclined to make a speculative venture to take advantage of the present opportunity. Quotations show no very marked change, Equitable alone excepted; the tendency is downward. By way of an interesting comparison we here give a very brief *resume* of highest and lowest quotations for city shares during '84: Manhattan, 327—260; Metropolitan, 257—215; Municipal, 240—195; New York, 169—145; Mutual, 138—117; Harlem, 138—105; Equitable, 105—85. We are in receipt of a communication from Mr. N. R. O'Connor, Secretary of the Harlem Illuminating Company, in which that individual, judging from what has been said in our columns regarding the future purposes of Messrs. Elkins, Maloney, *et al*, takes occasion to say that we are "misinformed as to the true object of the company," etc. We are likely to know when we have been "misinformed," and are always in readiness to acknowledge an error; but we take this occasion to inform the brilliantly versatile Secretary of the Elkins combination that we have no occasion to take back anything stated by us in regard to the Harlem Illuminating Company or its managers. We are sorry to inform our readers that Mr. Geo. Graham Lake, of New York city, came to an untimely death on date of Sunday, Dec, 21. While crossing West Broadway at Thomas street, on Dec. 12th, Mr. Lake attempted to pass in front of a heavy truck; he escaped the truck all right, but only to be knocked down by a rapidly moving street car of the 6th avenue line. He received a compound fracture of the leg, and the shock was of so severe a nature that he succumbed to its effects. Mr. Lake was one of the heaviest individual holders of gas securities in this country, and was at the time of his demise a director in the Harlem Company of this city, as also in the Williamsburgh Company of Brooklyn. One of his last important speculations was in regard to the settlement of the gas war at Baltimore, Md., for we guess it was in great part owing to him that the prevailing truce was effected.

Brooklyn shares are fairly steady. In out-of-town matters it is on the cards that Jersey City (N. J.) gas affairs will present a neat imbroglio before long. The United Gas Improvement Company having, as it is supposed, leased the works and plant of the Peoples and Jersey City Companies, proposes to wage a bitter warfare against the new Consumers Company, which concern will soon be ready to deliver gas. In view of all this it would seem as though a fair profit might be made by selling Jersey City shares at present quotations. Montreal gas is higher. Holders of Louisville (Ky.) gas need not be surprised at lower prices; and they should not take alarm at the shrinkage, as the two "B.'s" (Baxter and Barret) mean business.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
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FRIDAY, JANUARY 2, 1885.

Use of Sulphate of Ammonia in the Garden.

A contributor to a London exchange writes: Last year I was induced to try an experiment in chrysanthemum growing, and for this purpose purchased one pound of sulphate of ammonia, which I bottled and corked, as the ammonia evaporates very rapidly. I then selected four plants from my collection, putting them by themselves, gave them a teaspoonful of ammonia in a gallon of water twice a week. In a fortnight's time the result was most striking; for though I watered the others with liquid cow manure, they looked lean when compared with the ammonia watered plants, whose leaves turned to a very dark green, which they carried to the edge of the pots until the flowers were cut. As a matter of course the flowers were splendid. The ammonia used is rather expensive, as I bought it from a chemist's shop; this year I intend getting agricultural ammonia, which is much cheaper. I have also tried it on strawberries, with the same satisfactory result, the crop being nearly double that of the others; it is very powerful, and requires to be used with caution.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks (with A. E. SCOTT & Co.,)
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JAN. 2.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

	Capital.	Par.	Bid	Asked
Central	$440,000	50	60	—
" Scrip	220,000	—	47	57
Equitable	2,000,000	100	94	96
Harlem	2,000,000	50	115	117
" Bonds	170,000		—	—
Manhattan	4,000,000	50	260	270
Metropolitan	2,500,000	100	225	230
" Bonds	658,000	—	110	112
Mutual	3,500,000	100	120	122
" Bonds	1,500,000	1000	104	106
Municipal	3,000,000	100	205	210
" Bonds	750,000		107	110
New York	4,000,000	100	157	160
Northern	125,000	50	—	80
" Scrip	108,000			
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	126	128
Citizens	1,200,000	20	87	90
" S. F. Bonds	320,000	1000	106	110
Fulton Municipal	3,000,000	100	152	155
" Bonds	300,000		104	108
Peoples	1,000,000	10	77	80
" Bonds	290,000	—	105	110
" "	250,000	—	90	95
Metropolitan	1,000,000	100	94	96
Nassau	1,000,000	25	115	118
" Ctfs	700,000	1000	88	90
Williamsburgh	1,000,000	50	137	140
" Bonds	1,000,000	—	106	108
Richmond Co., S. I.	300,000	50	64	75
" Bonds	40,000	—	—	—
Out of Town Gas Companies.				
Buffalo Mutual, N. Y.	750,000	100	80	85
" Bonds	200,000	1000	95	100
Citizens, Newark	918,000	50	103	115
" " Bonds.	124,000	—	105	110
Chicago Gas Co., Ills	5,000,0000	25	125	—
Peoples G. L. & C. Co., Chicago, Ills			8	12
Cincinnati G. & C. Co.			180	182
Consolidated, Balt.	6,000,000		83	84
" Bonds	3,600,000		112½	113
Central, S. F., Cal.			—	60
Capital, Sacramento, Cal.			55½	—
Hartford, Conn	750,000	25	122	128
Jersey City	750,000	20	125	130
Laclede, St. Louis, Mo.	1,600,000	100	88	—
Louisville, Ky	1,500,000	50	95	100
Montreal, Canada	2,000,000	100	181	182½
New Haven, Conn		25	166	170
Oakland, Cal			29	30
Peoples, Jersey City		—	—	75
" " Bonds			—	—
Paterson, N. J		25	96	99
Rochester, N. Y		50	75	80
Washington, D. C	2,000,000	20	190	195
Wilmington, Del		50	188	—
Yonkers		50	—	—
St. Louis, Missouri	600,000	50	340	—
San Francisco Gas Co. San Francisco, Cal.			62½	62¾

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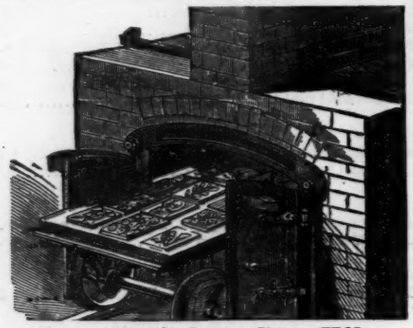

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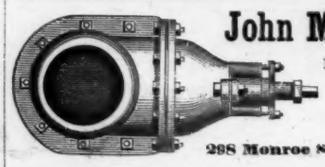

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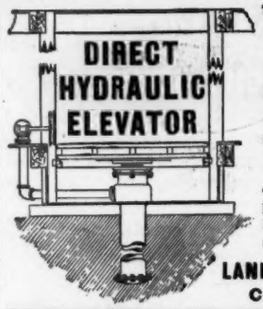

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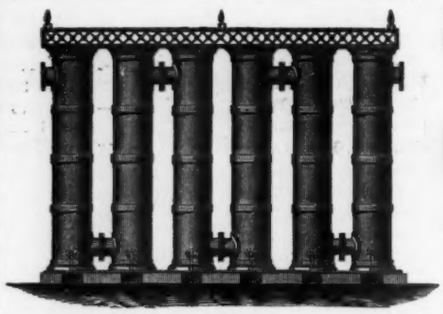

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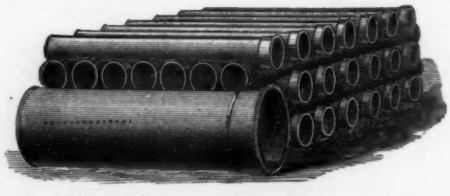

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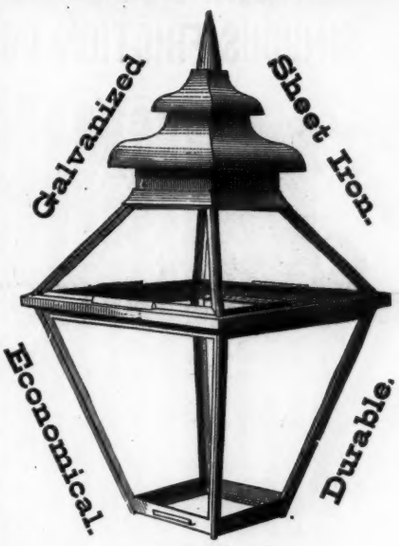

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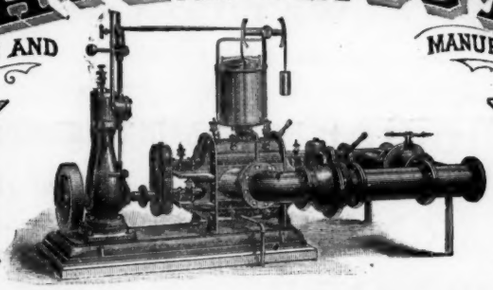

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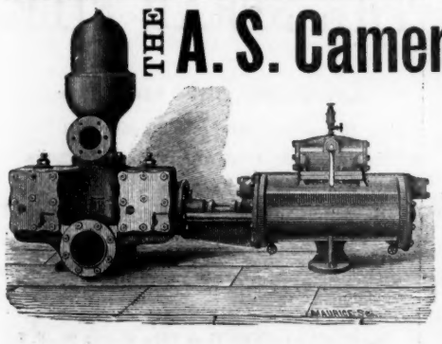

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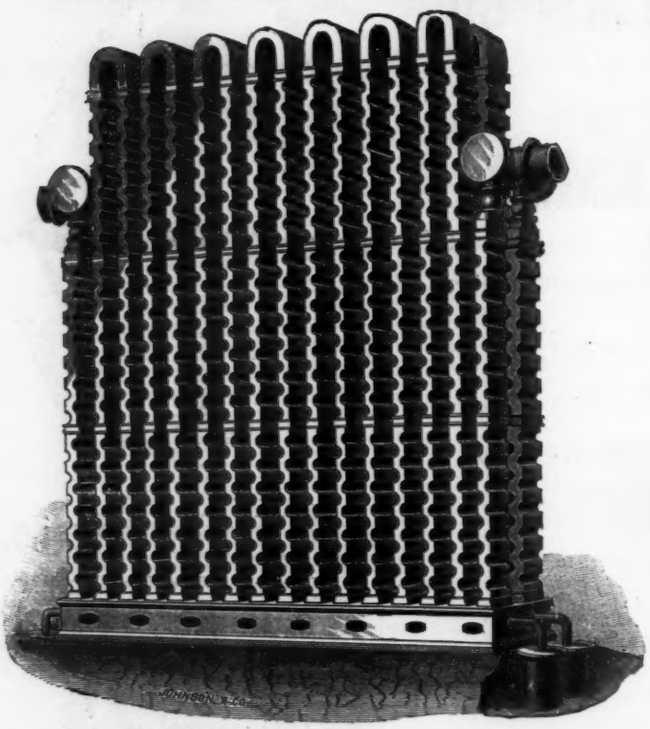

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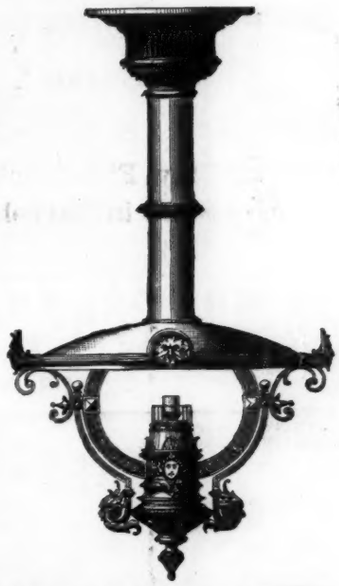

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1882	39,300,000 "
1883	57,735,000 "
1884	26,177,500 "
Total	235,937,500 cubic feet.

Total Number and Capacity per 24 Hours of "Standard" Washers Erected and in Course of Erection in the Several Countries

	Number.	Cubic Feet per Day.
Great Britain	151	157,070,000
Western Hemisphere	38	39,337,500
Australia	18	12,150,000
New Zealand	2	650,000
France	6	4,550,000
Belgium	8	5,420,000
Germany	16	8,200,000
Holland	4	4,160,000
Denmark	1	150,000
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Spain	1	350,000
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Total	248	235,937,500

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Bombay Gas Co	400,000
Brussels Co	1,250,000
Chemnitz Gas Co	1,000,000
CITIZENS GAS CO., BUFFALO	750,000
Coke Works in Zabre, Ober-Schlesien	1,500,000
Cokerei der Friedenshutte, Upper Silesia	500,000
Dumfries Corporation	250,000
Dunedin Gas Co., New Zealand	400,000
King's Lynn Gas Co	300,000
Leiden, Holland	600,000
Lincoln Gas Co	400,000
Liverpool Gas Co	2,000,000
" "	3,000,000
LOUISVILLE GAS CO	1,500,000
Numea Gas Co	100,000
PITTSBURGH GAS CO	1,500,000
PORTLAND GAS CO., Oregon	562,500
SAN FRANCISCO GAS CO	4,000,000
Sheepbridge	40,000
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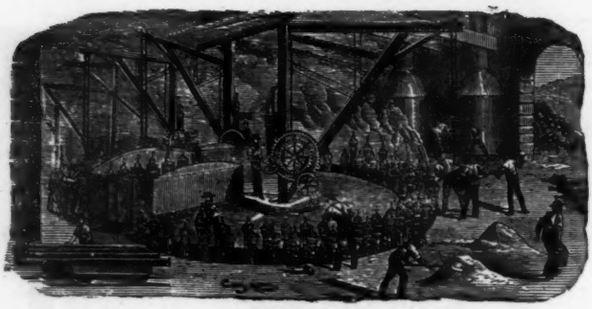

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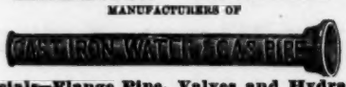

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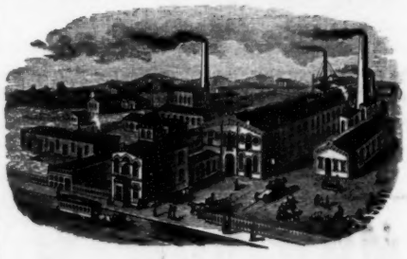

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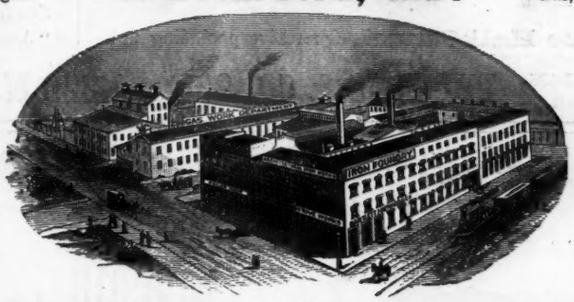

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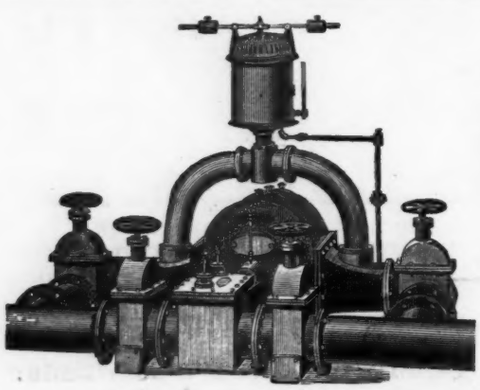

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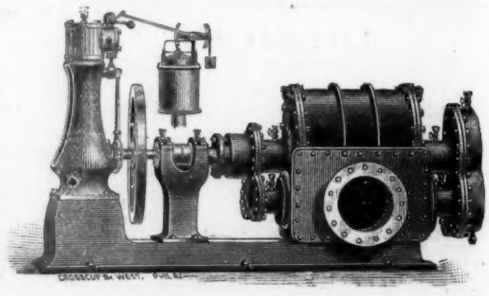

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